User Manual

AIMB-270

Intel® Core™ i7/i5Celeron®

µFC-PGA989 Mini-ITX with VGA/2DVI/LVDS, 6 COM, Dual LAN, PCIe x 16

Version July 2010

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Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

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In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC Class B

This device complies with the requirements in part 15 of the FCC rules:

Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

CPU Compatibility

CPU Family	Speed	sSpec.	Core Stepping	TDP	L3 cache
Intel i5-520M 2.4G	2.4G	SLBNB	C2	35W	3MB
Intel i7-620M 2.66G	2.66G	SLBPD	C2	35W	4MB

Memory Compatibility

Brand	Size	Speed	Type	ECC	Vendor PN	Advantech PN	Memory
Transcend	1GB	DDR3 1066	SODIMM DDR3	N	TS128MSK64V1U/ TS2KSU28200-1S	96SD3-1G1066NN-TR	SEC K4B1G0846D-HCF8(128x8)
	1GB	DDR3 1066	SODIMM DDR3	N	TS128MSK64V1U	96SD3-1G1066NN-TR	SEC HCH9 K4B1G0846D(128x8)
	2GB	DDR3 1066	SODIMM DDR3	N	TS256MSK64V1U/ TS5KSU28400-1S	96SD3-2G1066NN-TR	SEC K4B1G0846D-HCF8(128x8)
	2GB	DDR3 1066	SODIMM DDR3	N	TS128MSK64V1U	96SD3-2G1066NN-TR	SEC HCH9 K4B1G0846D (128x8)
Apacer	1GB	DDR3 1066	SODIMM DDR3	N	78.02GC3.420	96SD3-1G1066NN-AP	ELPIDA J1108BABG-DJ-E(128x8)
	2GB	DDR3 1066	SODIMM DDR3	N	78.A2GC3.421	96SD3-2G1066NN-AP	ELPIDA J1108BABG-AE-E(128x8)
Kingston	1GB	DDR3 1066	SODIMM DDR3	N	KVR1066D3S7/1G		ELPIDA J1108BABG-DJ-E? 085009KP5 (128x8)
	2GB	DDR3 1066	SODIMM DDR3	N	KVR1066D3S7/2G		ELPIDA J1108BABG-DJ-E 090309GFB (128x8)
	2GB	DDR3 1066	SODIMM DDR3	N	KVR1066D3S7/2G		KVR1066D3S7/2G (256x8)
DSL	1GB	DDR3 1066	SODIMM DDR3	N			ELPIDA J1108BASE-DJ-E (128x8)
Micron	1GB	DDR3 1066	SODIMM DDR3	N	MT8JSF12864HZ-1G1F1		Micron 9FF27 D9KPT (128x8)
Samsung	2GB	DDR3 1066	SODIMM DDR3	N	M471B5673DH1-CF8		SEC 904 HCF8 K4B1G0846D (128x8)
G.SKILL	4GB	DDR3 1066	SODIMM DDR3	N	F3-8500CL7S-4GBSQ		HYNIX H5TQ2G83AFR-G7C(256X8)
Transcend	1GB	DDR3 1333	SODIMM DDR3	N	TS128MSK64V3U		SEC 849 HCH9 K4B1G0846D (128x8)
	2GB	DDR3 1333	SODIMM DDR3	N	TS256MSK64V3U		SEC 904 HCF8 K4B1G0846D (128x8)
Apacer	1GB	DDR3 1333	SODIMM DDR3	N	78.02GC6.420		ELPIDA J1108BABG-DJ-E (128x8)
DSL	1GB	DDR3 1333	SODIMM DDR3	N	D3SE28081XG5AA		ELPIDA J1108BASE-DJ-E (128x8)
Kingston	1GB	DDR3 1333	SODIMM DDR3	N	KVR1333D3S9/1G		E LPIDA J1108BDBG-DJ-F (128x8)

Ordering Information

Part Number	Chipset	VGA	2 DVI	SWRAID	USB	COM	GbE LAN
AIMB-270G2-00A1E	QM57	Yes	Yes Yes	8	6	2	

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- 1 x AIMB-270 Intel Core™ i7/i5/Celeron µFC-PGA989 Mini-ITX motherboard
- 2 x SATA HDD cable
- 2 x SATA Power cable
- 1 x CPU cooler
- 1 x Cable kit for 4 serial ports
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Driver CD
- 1 x Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-270 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-270, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

General Information

1.1 Introduction

AIMB-270 is designed with the Intel® QM57 for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel® mobile Core™ i7-620M 2.66 GHz / Core™ i5-520M 2.4GHz / Celeron® P4500 1.86GHz processor up to 4 MB L2 cache and DDR3 800/ 1066 up to 8 GB. A rich I/O connectivity of 6 serial ports, 8 USB 2.0, dual GbE LAN and 4 SATA ports.

1.2 Features

- **Rich I/O connectivity:** 6 serial ports, 8 USB 2.0, Dual GbE LAN
- **Standard Mini-ITX form factor with industrial feature:** The AIMB-270 is a full-featured Mini-ITX motherboard with balanced expandability and performance
- **Wide selection of storage devices:** SATA HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity
- **Optimized integrated graphic solution:** With Intel® Graphics Flexible, it supports versatile display options and 32-bit 3D graphics engine

1.3 Specifications

1.3.1 System

- **CPU:** µFC-PGA989 Intel mobile Core i7-620M 2.66 GHz / Core i5-520M 2.4GHz / Celeron P4500 1.86GHz processor
- **BIOS:** AMI 64 Mbit SPI BIOS
- **System chipset:** Intel® QM57
- **SATA hard disk drive interface:** Four on-board SATA connectors with data transmission rate up to 300 MB
- **CF interface:** Supports compact flash Type II

1.3.2 Memory

- **RAM:** Up to 8 GB in 2 slots 204-pin SODIMM sockets. Supports dual channel DDR3 800/1066 SDRAM

1.3.3 Input/Output

- **PCI bus:** 1 PCIe x16 slot
- **Serial ports:** Six serial ports, only RS-232 serial ports
- **Keyboard and PS/2 mouse connector:** Supports one standard PS/2 keyboard, one standard PS/2 mouse (On board 6pin wafer box)
- **USB port:** Supports up to eight USB 2.0 ports with transmission rate up to 480 Mbps, 4 on board pin header and 4 external ports)
- **GPIO connector:** 8-bit general purpose Input/Output

1.3.4 Graphics

- **Controller:** Intel® HD Graphics
- **Display memory:** 1 GB maximum shared memory with 2GB and above system memory installed
- **DVI:** Supports DVI up to resolution 1920 x 1200 @ 60Hz refresh rate
- **VGA:** Supports VGA up to resolution 2048 x 1536 @ 75Hz refresh rate
- **LVDS:** Supports LVDS up to resolution 1920 x 1200

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
- **Controller:** LAN1: Intel 82577LM; LAN2: Intel 82583v

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, +12 V, -12 V, 5 Vsb
- **Power consumption:**

  Intel® Core™ i5-520M 2.4 GHz, 3 MB L2 cache, 2 pcs 4 GB DDR3 1066 MHz, +5 V @ 3.42 A, +3.3 V @ 1.1 A, +12 V @ 1.19 A, 5 VSB @ 0.5 A, -12 V @ 0 A

  Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- **Board size:** 170 mm x 170 mm (6.69" x 6.69")
- **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-270 motherboard link it to devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumpers

Label	Function
JFP1	Power switch/HDD LED/SMBus/Speaker
JFP2	Power LED and Keyboard lock
CMOS1	CMOS clear (Default 1-2)
PSON1	AT(1-2) / ATX(2-3) (Default 2-3)
JWDT1+JOBS1	Watchdog Reset and OBS Alarm
JCASE1	Case Open pin header
JLVDS1	Voltage 3.3V/5V selector for LVDS1 connector (Default 1-2, 3.3V)
JLVDS2	Voltage 12 V selector for LVDS1 and LVDS2 connector

Table 1.1: Jumpers	
JLVDS_CLT1	Brightness control selector for Analog or Digital (Default 1-2, Analog)
JWE1	Jumper for update BIOS ME mode

Table 1.2: Connectors	
Label	**Function**
LVDS1	LVDS1 connector
INV1	LVDS1 inverter connector
COM3456	Serials port connector (RS-232)
USB56	USB port 5, 6 (on board)
USB78	USB port 7, 8 (on board)
VGA1+DVI1	VGA and DVI connector
COM12	Serial port connector(RS232)
KBMS1	PS/2 Keyboard and Mouse connector
CPUFAN1	CPU FAN connector(4-pin)
SYSFAN1	System FAN1 connector(4-pin)
SYSFAN2	System FAN2 connector(4-pin)
LAN1_USB12	LAN1 / USB port 1, 2
LAN2_USB34	LAN2 / USB port 3, 4
AUDIO1	Audio connector
SPDIF_OUT1	SPDIF Audio out pin header
FPAUD1	HD Audio Front Panel Pin Header
PCIEX16_1	PCIe x16 Slot
SATA1	Serial ATA data connector 1
SATA2	Serial ATA data connector 2
SATA3	Serial ATA data connector 3
SATA4	Serial ATA data connector 4
DIMM1	Memory connector channel
DIMM2	Memory connector channel
SPI_CN1	SPI flash update connector.
GPIO1	GPIO header
EATXPWR2	ATX 12V Auxiliary power connector (for CPU)
EATXPWR1	ATX 20 Pin Main power connector (for System)

1.5 Board layout: Jumper and Connector Locations

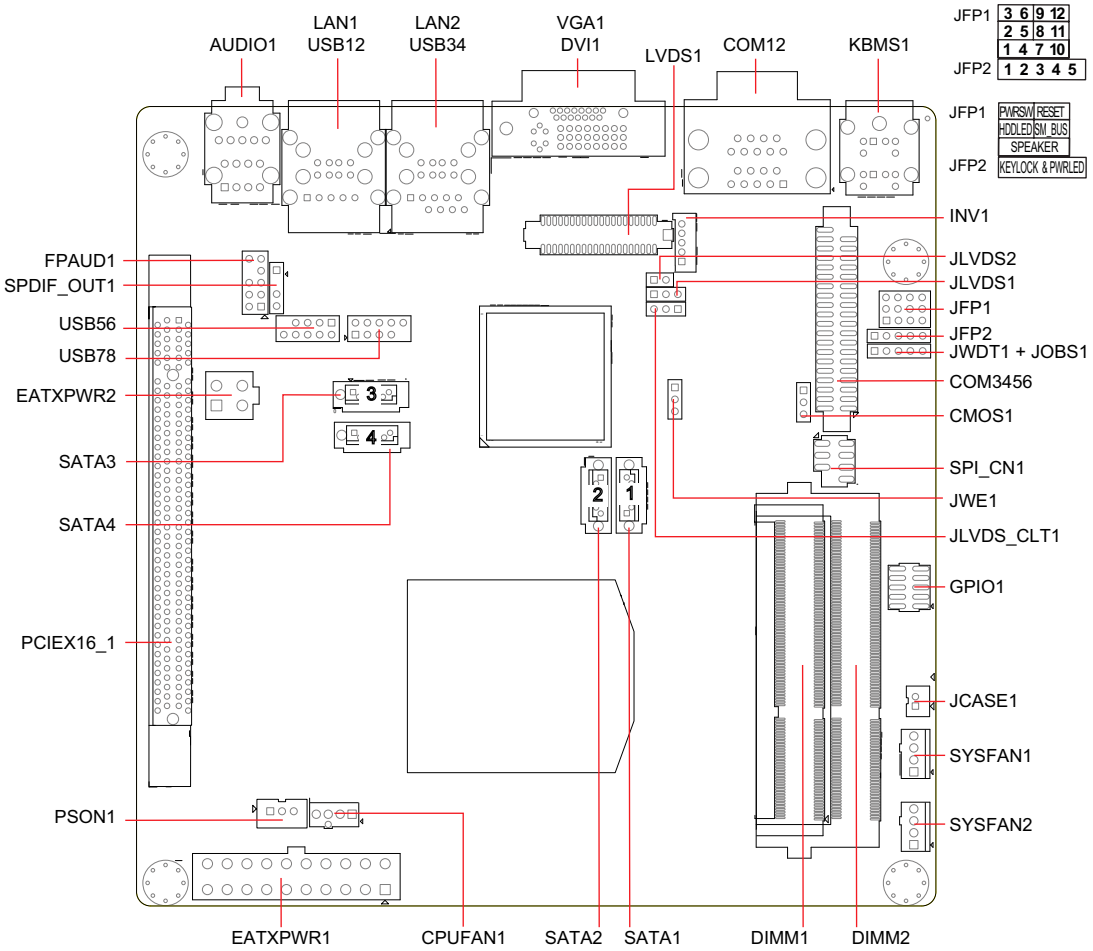


Figure 1.1 Jumper and Connector Location

Figure 1.2 I/O Connectors

1.6 AIMB-270 Board Diagram

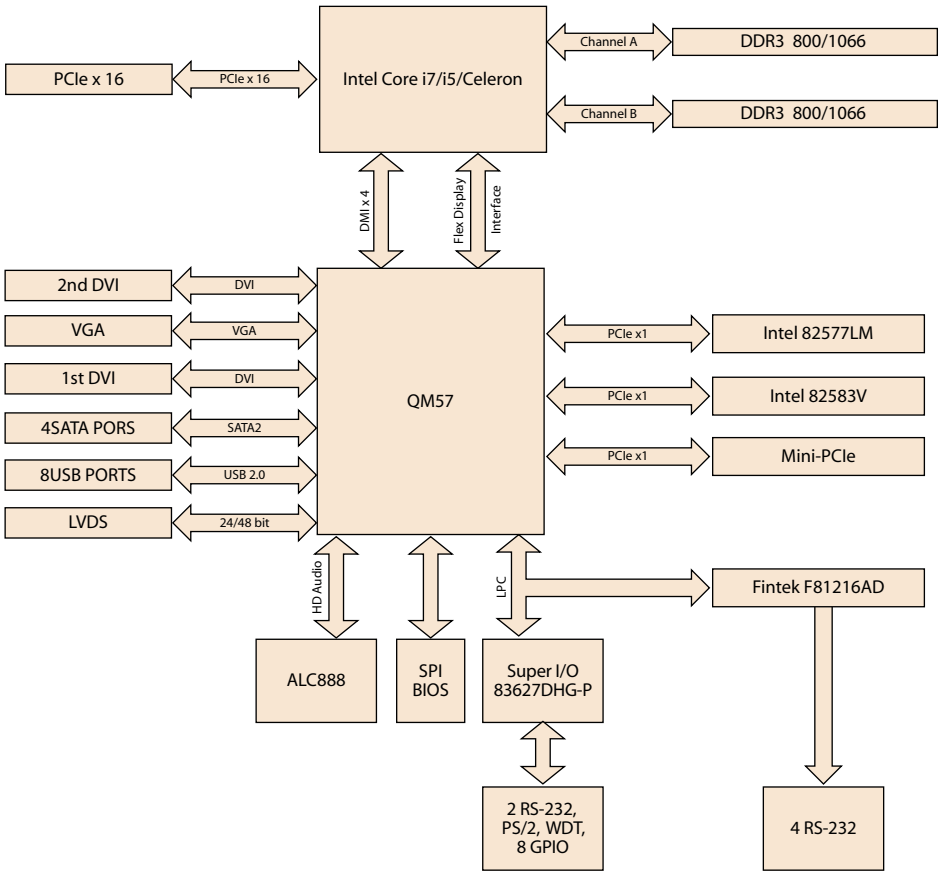


Figure 1.3 AIMB-270 Board Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electro-static discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Caution! *The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboards's default settings and your options for each jumper.

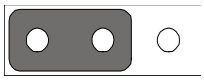
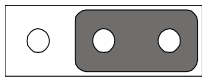
1.8.1 How to Set Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS Clear (CMOS1)

The AIMB-270 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS1

Function	Jumper Setting	
*Keep CMOS data		1-2 closed
Clear CMOS data		2-3 closed

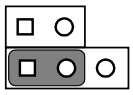
* Default

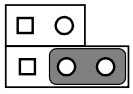
1.8.3 JLVDS1 and JLVDS2: LCD Power 3.3 V/5 V/ 12 V Selector

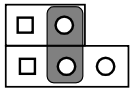
Table 1.4: JLVDS1 and JLVDS2: LCD Power 3.3 V/5 V/ 12 V Selector

Closed Pins	Result
JLVDS1	
1-2*	For 3.3 V LVDS Panel
2-3	For 5 V LVDS Panel
JLVDS1 and JLVDS2	
2-2	For 12 V LVDS Panel

*Default

JLVDS1  for 3.3V LVDS panel

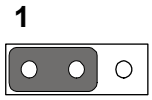
JLVDS1  for 5V LVDS panel

JLVDS2
JLVDS1  for 12V LVDS panel

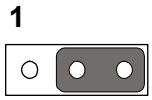
1.8.4 JLVDS_CLT1: Backlight control selector for LVDS1

Table 1.5: JLVDS_CLT1: Backlight control selector for LVDS1	
Closed Pins	Result
1-2*	Linear brightness control
2-3	PWM brightness control

*Default



Linear brightness control
1-2 closed

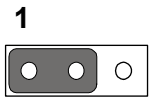


PWM brightness control
2-3 closed

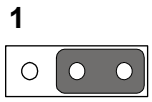
1.8.5 PSON1: ATX, AT Mode Selector

Table 1.6: PSON1: ATX, AT Mode Selector	
Closed Pins	**Result**
1-2	AT Mode
2-3*	ATX Mode

*Default



AT Mode
1-2 closed

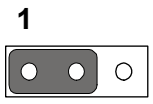


ATX Mode
2-3 closed

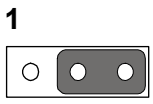
1.8.6 JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option

Table 1.7: JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option	
Closed Pins	**Result**
1-2	NC
2-3*	System Reset*
4-5*	Error Beep*

*Default



NC
1-2 closed



System Reset
2-3 closed

1.8.7 JCASE1: Case Open Sensor

The AIMB-270 motherboard contains a jumper that offer a chassis open sensor. The buzzer on the motherboard beeps when the case is opened.

1.9 System Memory

The AIMB-270 has two sockets for a 204-pin DDR3 SODIMM.

This socket uses a 1.5 V unbuffered double data rate synchronous DRAM (DDR SDRAM). DRAM is available in capacities of 1 GB, 2 GB and 4GB. The sockets can be filled in any combination with SODIMMs of any size, giving a total memory size between 1 GB, 2 GB and 4GB. AIMB-270 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install SODIMMs, first make sure the two handles of the SODIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the SODIMM module along the plastic guides on both ends of the socket. Then press the SODIMM module well down into the socket, until you hear a click when the two handles have automatically locked the memory module into the correct position of the SODIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism.

1.11 Cache Memory

The AIMB-270 supports a CPU with one of the following built-in full speed L2 caches:

4 MB for Intel Core i7-620M CPU

3 MB for Intel Core i5-520M CPU

2 MB for Intel Celeron CPU

The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

1.12 Processor Installation

The AIMB-270 is designed for µFC-PGA989, Intel mobile Core i7/Core i5/Celeron processor.

Chapter 2

Connecting Peripherals

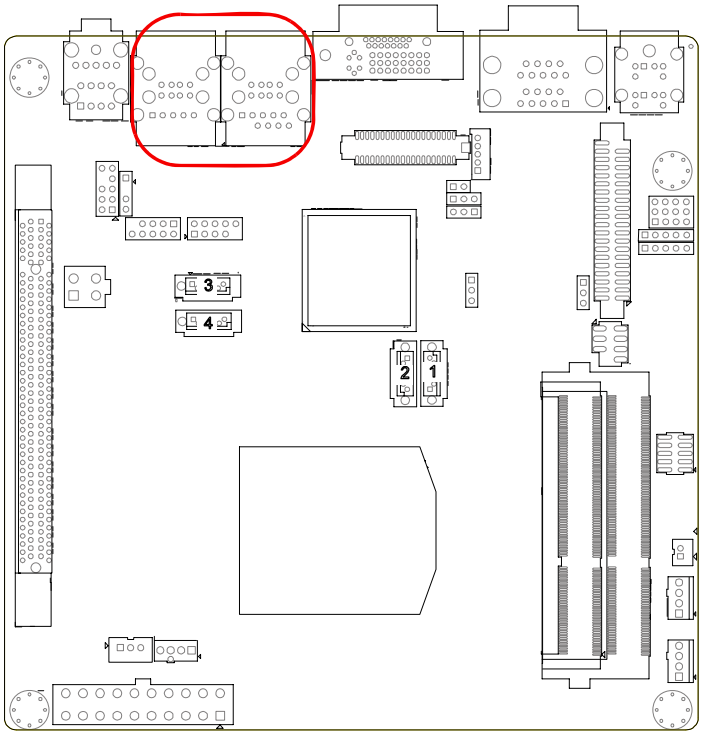
2.1 Introduction

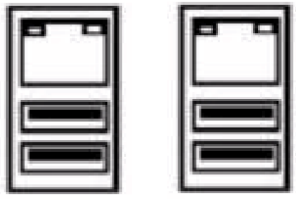
You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 USB Ports (LAN1_USB12/LAN2_USB34/USB56/USB78)

The AIMB-270 provides up to eight USB ports. The USB interface complies with USB Specification Rev. 2.0 supporting transmission rate up to 480 Mbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.

The AIMB-270 is equipped with one high-performance 1000 Mbps Ethernet LAN adapter, and one 100 Mbps LAN adapter, both of which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provide for convenient LAN connection.





LAN1_USB12 LAN2_USB34

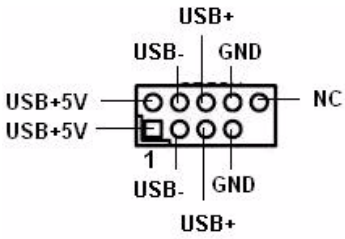
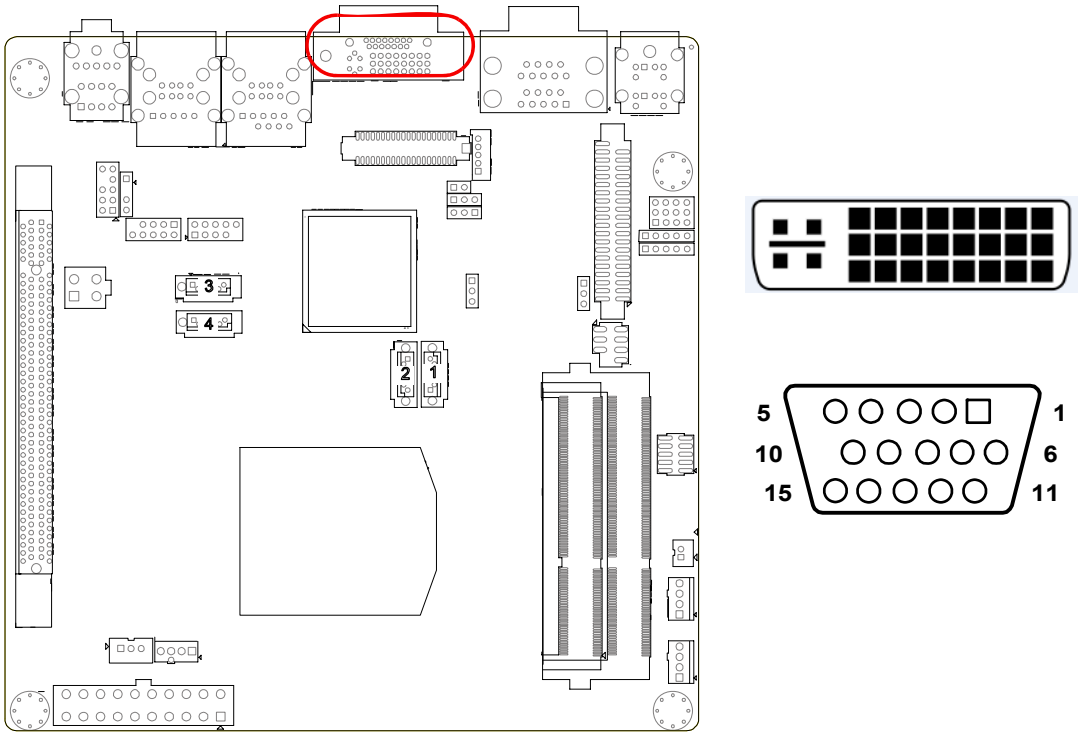


Table 2.1: LAN LED Indicator

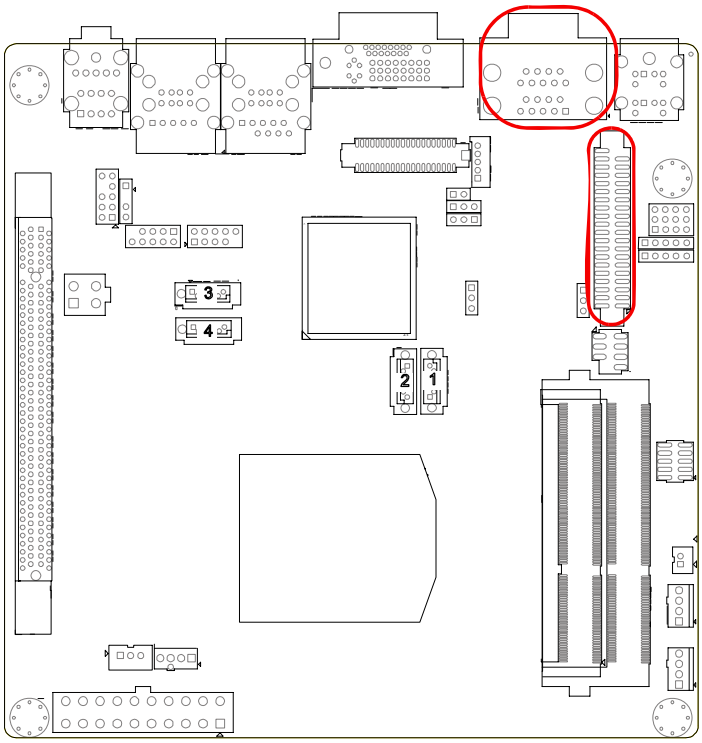
LAN Mode	LAN Indicator	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)

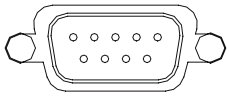
2.3 VGA/DVI Connector (VGA1+DVI1)



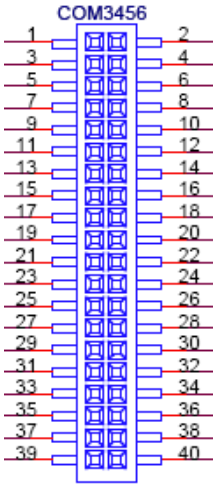
The AIMB-270 includes VGA and DVI interface that can drive conventional VGA and DVI displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. DVI1 is DVI-I connector but only for DVI-D single link signals output. Pin assignments for VGA and DVI connector are detailed in Appendix B.

2.4 Serial Ports (COM1~COM6)





COM1/COM2



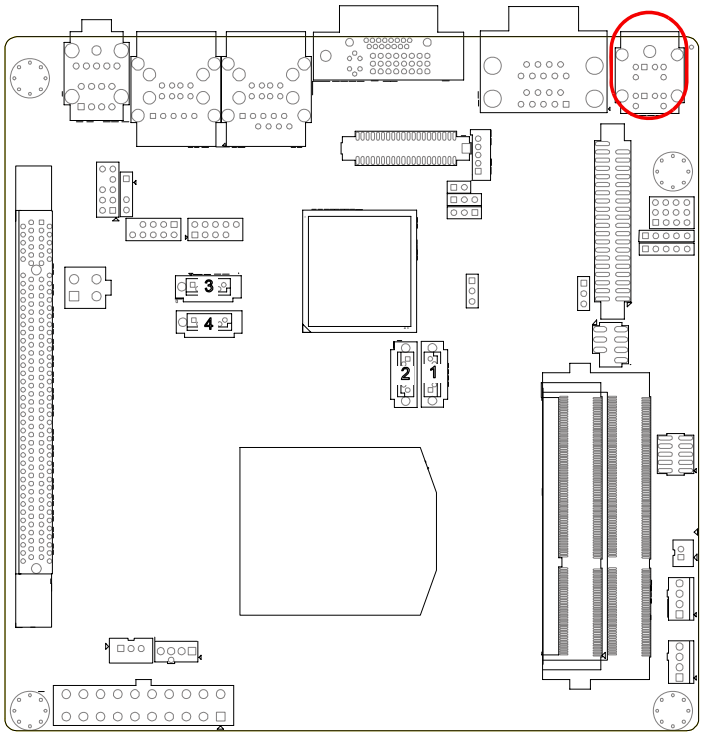
AIMB-270 supports six serial ports. COM1 ~ COM6 only support RS-232.

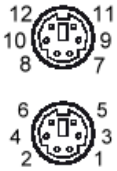
These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.

Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

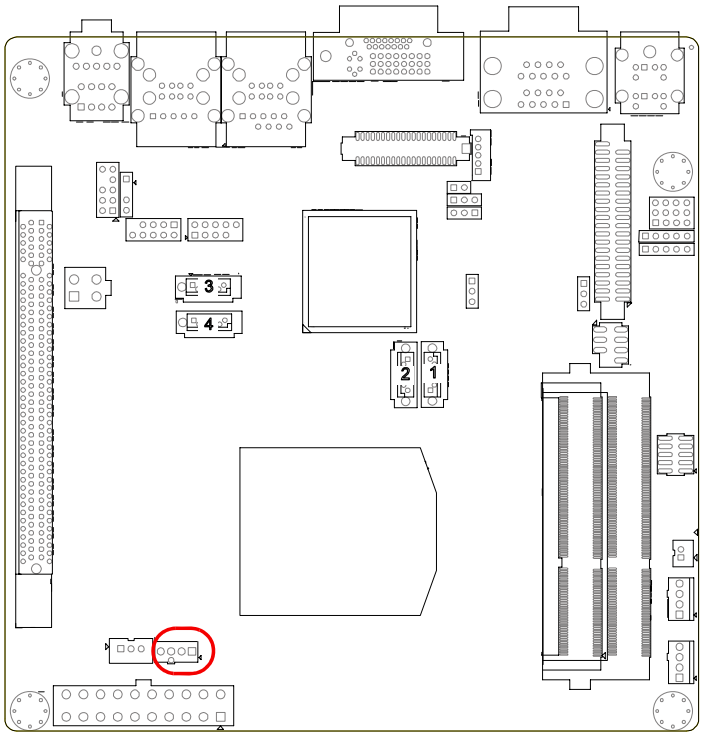
2.5 PS/2 Keyboard and Mouse Connector (KBMS1)





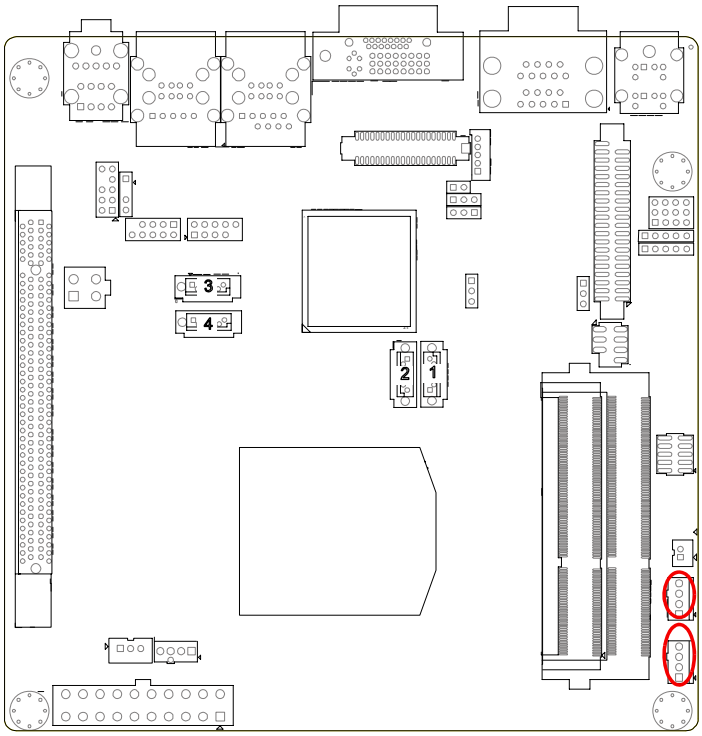
Two 6-pin mini-DIN connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively.

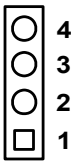
2.6 CPU Fan Connector (CPU_FAN1)



If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.7 System FAN Connector (SYSFAN1/2)

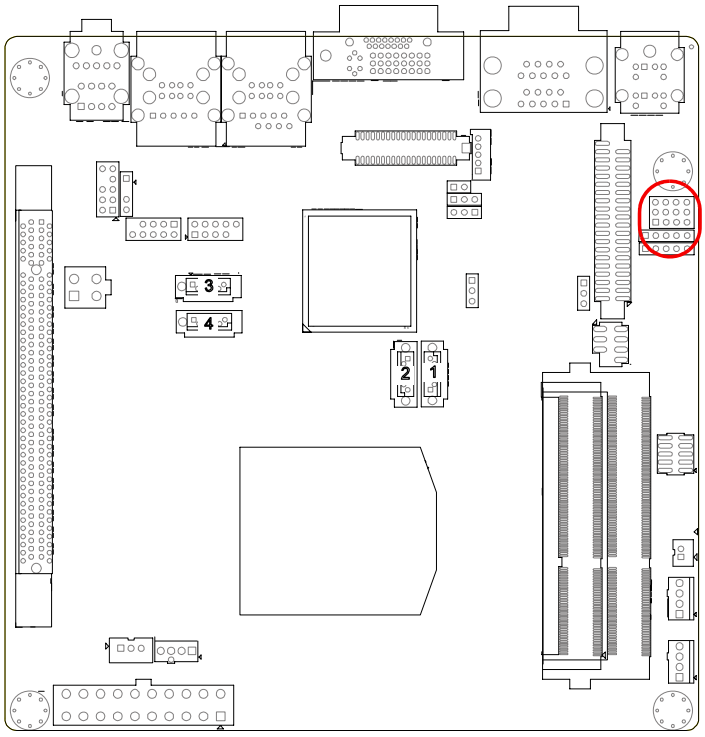


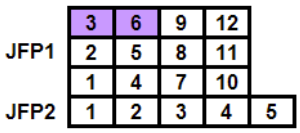


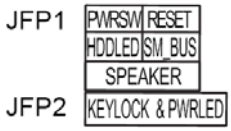
If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.8 Front Panel Connectors (JFP1/JFP2)

There are several headers for monitoring and controlling the AIMB-270.







2.8.1 ATX soft power switch ((JFP1/PWR_SW))

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to ((JFP1/ PWR_SW)), for convenient power on and off.

2.8.2 Reset (JFP1/RESET)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.8.3 HDD LED (JFP1/HDDLED)

You can connect an LED to connector (JFP2/HDDLED) to indicate when the HDD is active.

2.8.4 External speaker (JFP1/SPEAKER)

JFP1/SPEAKER is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-270 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.

2.8.5 Power LED and keyboard lock connector (JFP2/PWR_LED & KEY LOCK)

(JFP2/PWR_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable

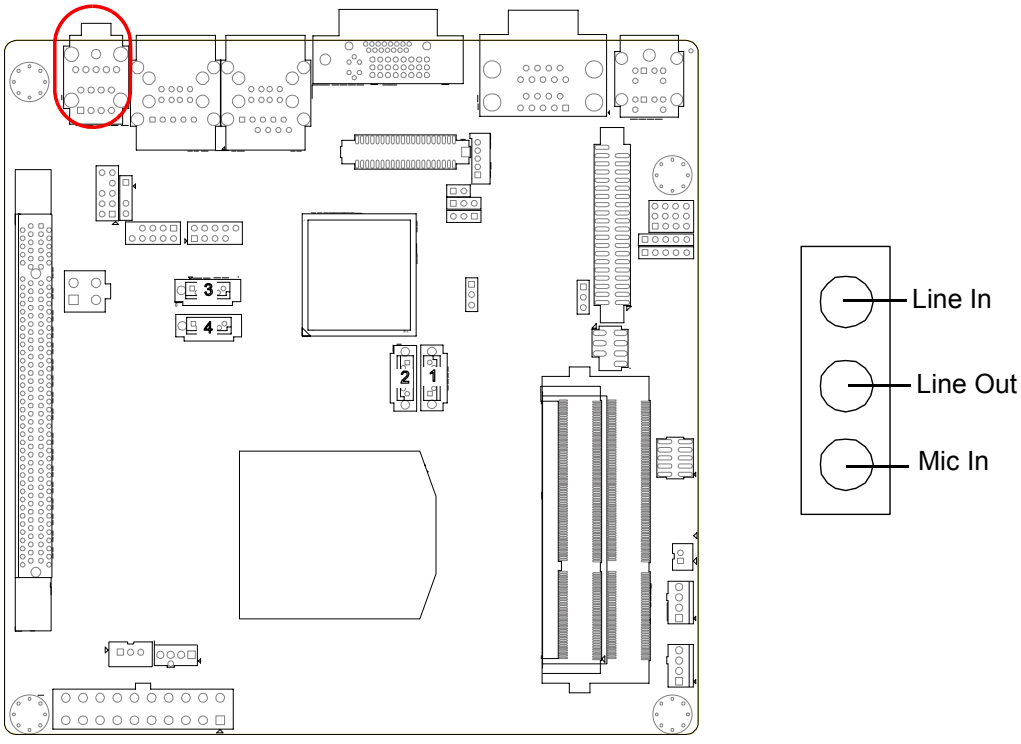
should be connected to pin 4-5.

There are 3 modes for the power supply connection. The first is “ATX power mode”; the system turns on/off by a momentary power button. The second is “AT Power Mode”; the system turns on/off via the power supply switch. The third is another “AT Power Mode” which makes use of the front panel power switch. The power LED status is indicated in the following table:

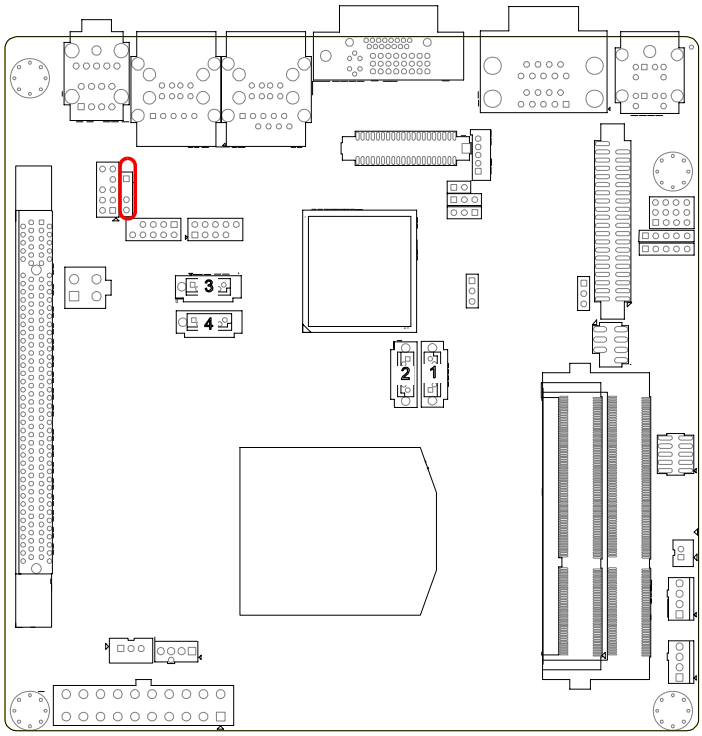
Table 2.2: ATX power supply LED status (No support for AT power)

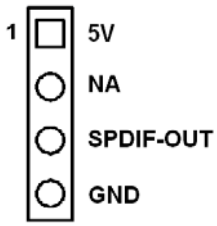
Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Suspend	Fast flashes	Fast flashes	Fast flashes
System Off	Slow flashes	Off	Off

2.9 Line In, Line Out, Mic In Connector (AUDIO1)

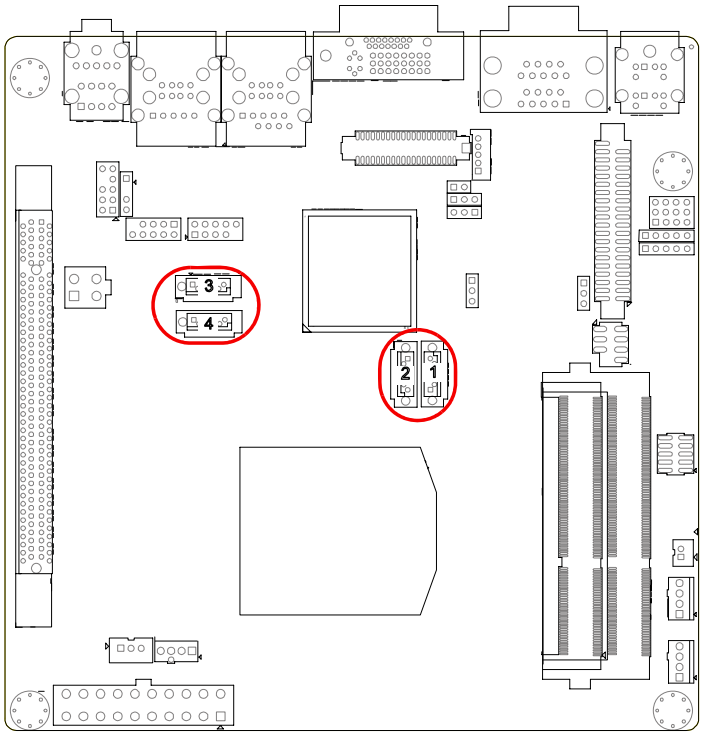


2.10 Digital Audio Connector(SPDIF_OUT1)



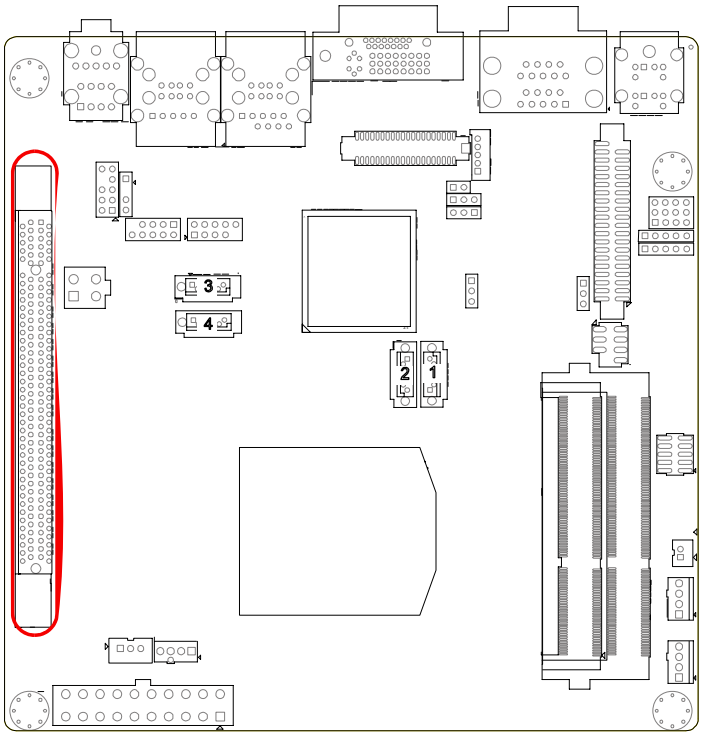


2.11 Serial ATA Interface (SATA1 ~ SATA4)



AIMB-270 features a high performance Serial ATA interface (up to 300 MB/s) which eases hard drive cabling with thin, space-saving cables.

2.12 PCI express x16 slot



The AIMB-270 provides 1 x PCI express x16 slot.

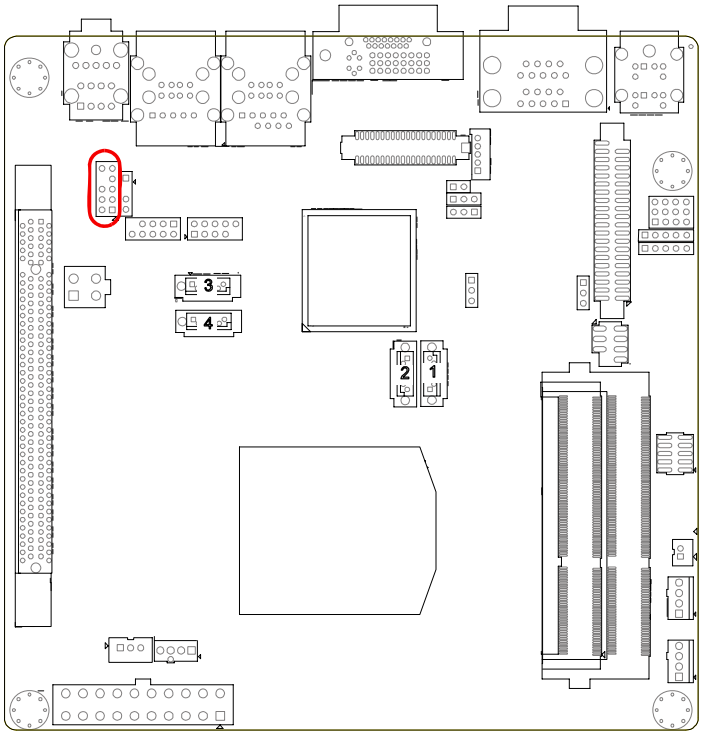
Note! *Intel QM57 chipset supports PCIe x16 slot (Gen 2.0), but it still has some compatibility issues with certain interface cards; below is the compatibility list table.*

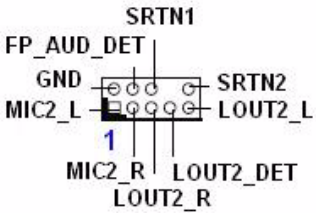
Table 2.3: PCI-E Card

Type	Brand Name	Model	Bus	Advantech PN	Result
VGA card * With SPDIF interface	ASUS	EN9400GT/512M (nVIDIA 9400GT)	PCI-E X16	NA	PASS
	GIGABYTE	GV-NX88T512H-B (nVIDIA GeForce 8800GT)	PCI-E X16 (Gen2)	NA	Fail
	Leadtek	PX9600GT DDR3 HDCP 256BIT (NVIDIA GeForce 9600GT)	PCI-E X16 (Gen2)	NA	PASS
	PowerColor	HD 4670 PCS (AX4670 512MD3-P)	PCI-E X16 (Gen2)	NA	Fail
	MSI	RX3870-T2D512E/D4 (Radeon HD 3870)	PCI-E X16 (Gen2)	NA	PASS
	Leadtek	PX9500GT (NVIDIA GeForce 9500 GT)	PCI-E X16 (Gen2)	NA	PASS
	ASUS	EN9600GSO ULTIMATE / 384M/ A	PCI-E X16	NA	PASS
	ASUS*	EN9800GT HybirdPower (NVIDIA GeForce 9800GT)	PCI-E X16 (Gen2)	NA	PASS
	ASUS	EAH4850 1GB (ATI Radeon HD 4850)	PCI-E X16 (Gen2)	NA	PASS
	Leadtek	PX8500GT TDH (NVIDIA GeForce 8500 GT)	PCI-E X16	NA	PASS
	MSI*	NX8600GTS Diamond Plus (NVIDIA GeForce 8600 GTS)	PCI-E X16	NA	PASS
LAN	SUNIX	LAN1400 MARVELL8053	PCI-E X1	NA	Fail
	Intel	Intel 9400PT Server adapter	PCI-E X1	NA	PASS
	Intel	Intel E1G42ETG1P20	PCI-E x 4	NA	PASS
SATA RAID	SUNIX	SATA2400P	PCI-E X1	NA	PASS
SATAII RAID	Adaptec	AAR-1220SA (2 ports)	PCI-E X1	NA	Fail
	Adaptec	AAR-1430SA (4 ports)	PCI-E X4	NA	PASS
	HighPoint	RocketRAID 3510 Intel IOP 81341	PCI-E X8	NA	Fail
	Areca	ARC-1210-X8 (4 ports)	PCI-E X8	NA	Fail
TV- Card	UPMOST	UTV-G PLUS global TV card	PCI-E X1	NA	Fail
	COMPRO	Compro VideoMate Vista E500F TV card	PCI-E X1	NA	PASS
USB	SUNIX	USB4414N	PCI-E X1	NA	PASS
Combo (1394B+ USB2.0)	SUNIX	UFC2412	PCI-E X1	NA	PASS
Sound	Creative	SB X-Fi Titanium Fatallty Pro	PCI-E X1	NA	PASS

2.13 Front Headphone Connector (FPAUD1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 (optional) audio standard. Connect this connector with the front panel audio I/O module cable.

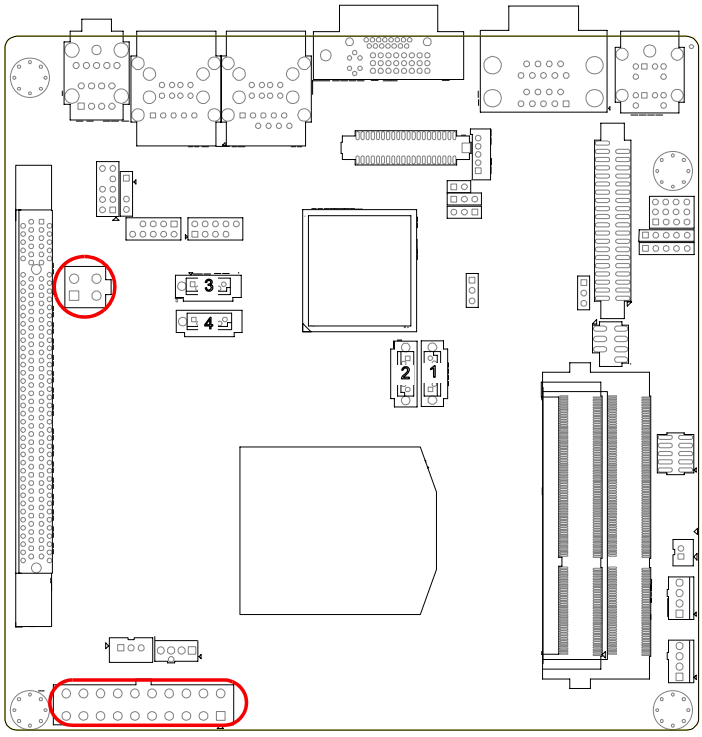


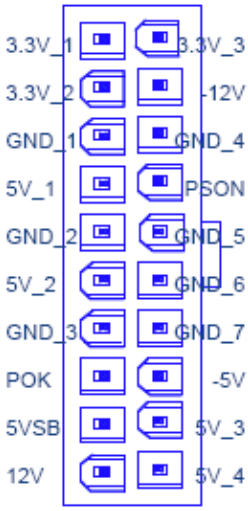


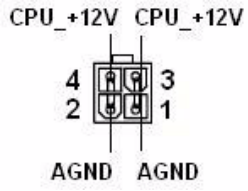
Note! *For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.*

2.14 ATX Power Connector (EATXPWR1, EATXPWR2)

This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.





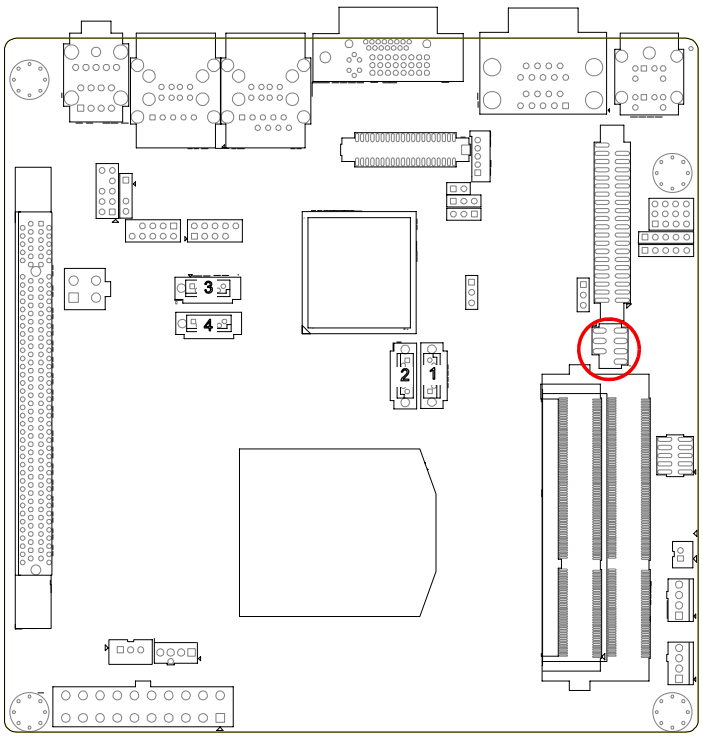


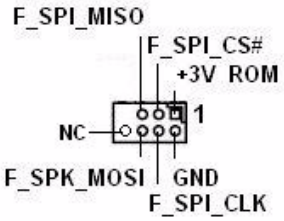
Note!

1. Please do connect the EATXPWR2 connector with the PSU ATX 12V 4-pin connector.
2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 180 W.

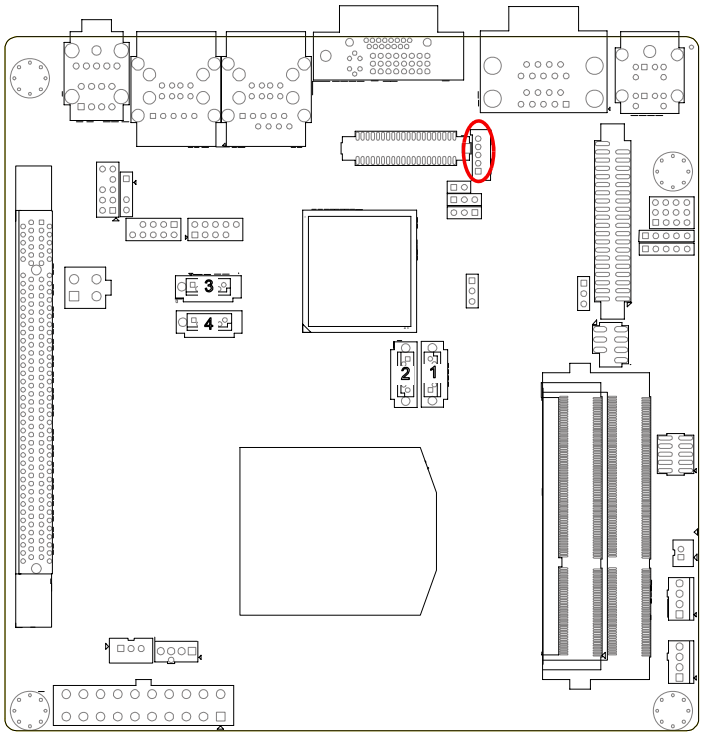
2.15 SPI Flash connector(SPI_CN1)

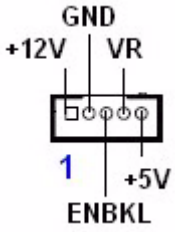
The SPI flash card pin header may be used to flash BIOS if the AIMB-270 cannot power on.





2.16 LCD Inverter Connector (INV1)

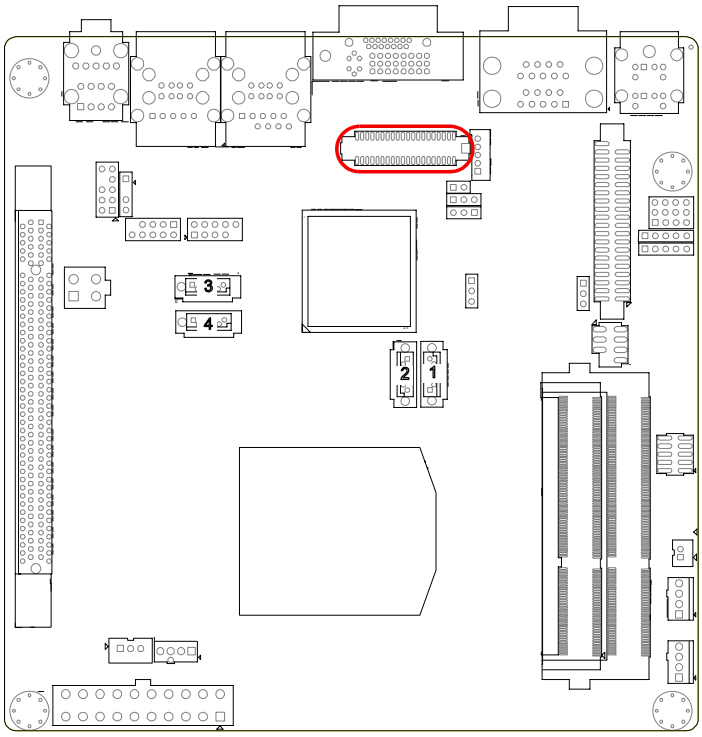


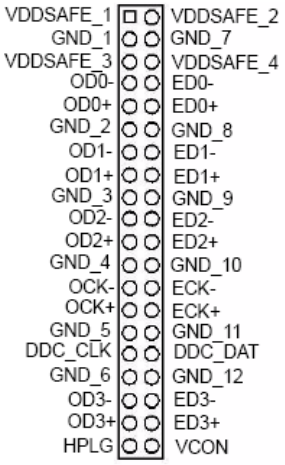


Note! ■ **Signal Description**

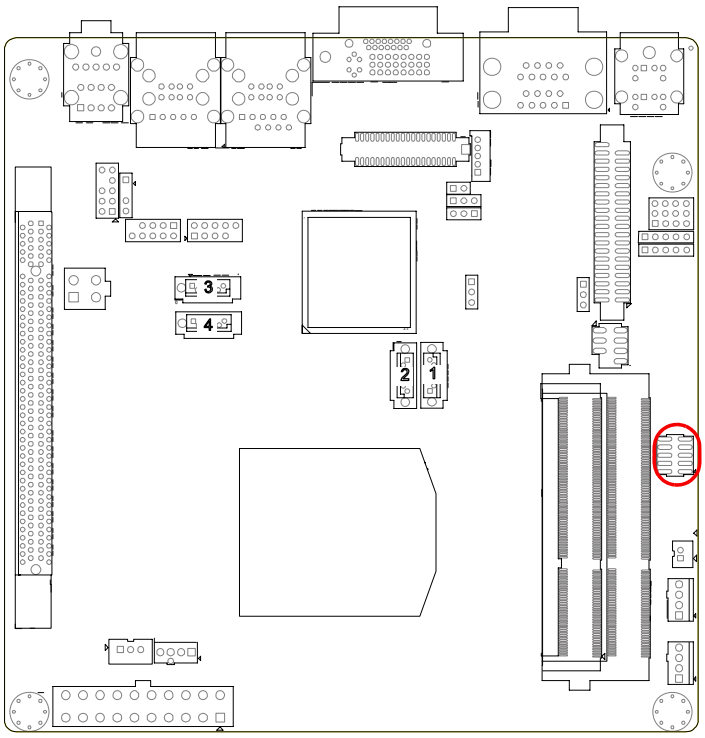
Signal	***Signal Description***
VR	*Vadj=0.75 V* *(Recommended: 4.7 KΩ, >1/16 W)*
ENBKL	*LCD backlight ON/OFF control signal*

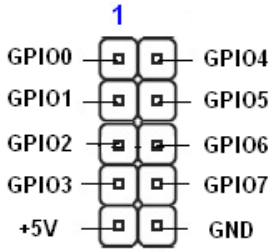
2.17 LVDS Connector (LVDS1)





2.18 General purpose I/O Connector (GPIO1)





Chapter 3

BIOS Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. People sometimes refer to the AMI BIOS setup menu as BIOS, BIOS setup or CMOS setup.

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning special features on or off. This chapter describes the basic navigation of the AIMB-270 setup screens.

3.2 BIOS Setup

The AIMB-270 Series system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features.

The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM.

When the power is turned on, press the <Del> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
< ↑ >< ↓ >< ← >< → >	Move to select item
<Enter>	Select Item
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Setup Defaults
<F10>	Save all CMOS changes

3.3 Main Menu

Press <Del> to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.3.7
Project Version 270X0055 -- 0.14 x64
Build Date 05/03/2010 17:25:02
Memory Information
Total Memory 512 MB (DDR3 800)
System Language [English]
System Date [Mon 05/03/2010]
System Time [17:30:37]
Access Level Administrator
Choose the system default language
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

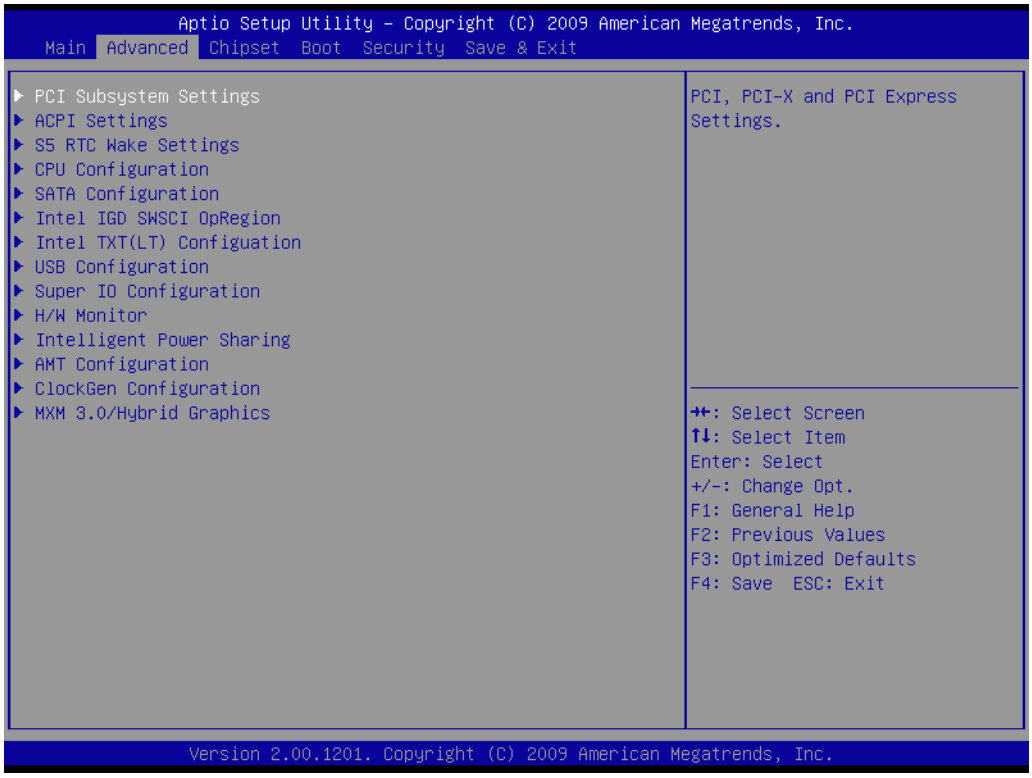
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

- **System time / System date**

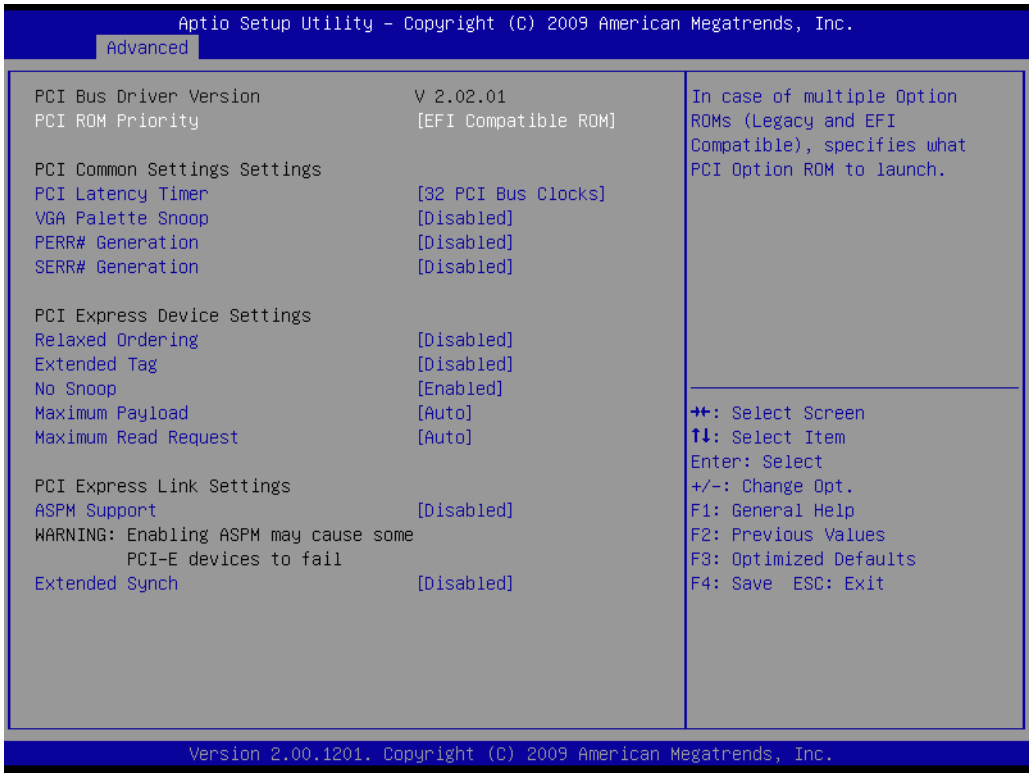
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.3.1 Advanced BIOS Features

Select the Advanced tab from the AIMB-270 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



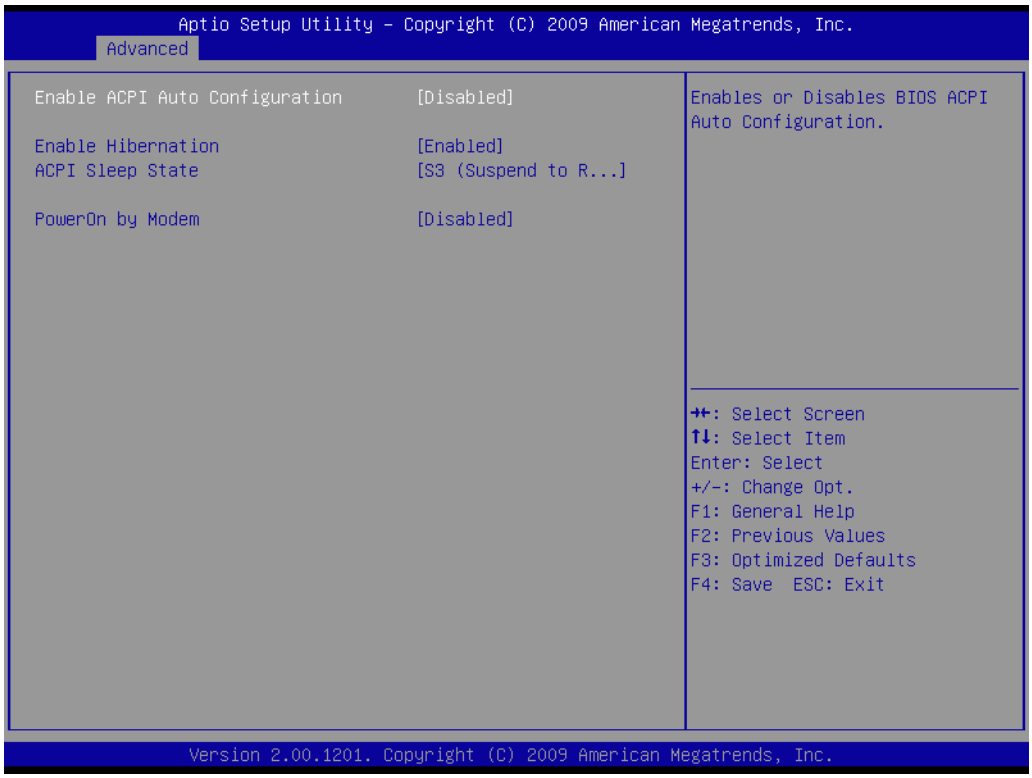
3.3.2 PCI Subsystem Settings


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
PCI Bus Driver Version V 2.02.01
PCI ROM Priority [EFI Compatible ROM]
PCI Common Settings Settings
PCI Latency Timer [32 PCI Bus Clocks]
VGA Palette Snoop [Disabled]
PERR# Generation [Disabled]
SERR# Generation [Disabled]
PCI Express Device Settings
Relaxed Ordering [Disabled]
Extended Tag [Disabled]
No Snoop [Enabled]
Maximum Payload [Auto]
Maximum Read Request [Auto]
PCI Express Link Settings
ASPM Support [Disabled]
WARNING: Enabling ASPM may cause some PCI-E devices to fail
Extended Synch [Disabled]
In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **PCI ROM Priority**
  Select the legacy or EFI compatible ROM
- **PCI Latency timer**
  Value in units of PCI clocks for PCI device latency timer register.
- **VGA Palette Snoop**
  This item is designed to solve problems caused by some non-standard VGA cards.
- **PERR# Generation**
  Enables or Disables PCI Device to Generate PERR#.
- **SERR# Generation**
  Enables or Disables PCI Device to Generate SERR#.
- **Relaxed Ordering**
  Enables or Disables PCI Express Device Relaxed Ordering.
- **Extended Tag**
  If ENABLED, allows Device to use 8-bit Tag field as a requester.
- **No Snoop**
  Enables or Disables PCI Express Device No Snoop option.
- **Maximum Payload**
  Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.
- **Maximum Read Request**
  Set Maximum Read Request Size of PCI Express Device or allow System BIOS to select the value.
- **ASPM Support**
  Set the ASPM Level: Force L0 - Force all links to L0 State: AUTO - BIOS auto configure: DISABLE - Disables ASPM

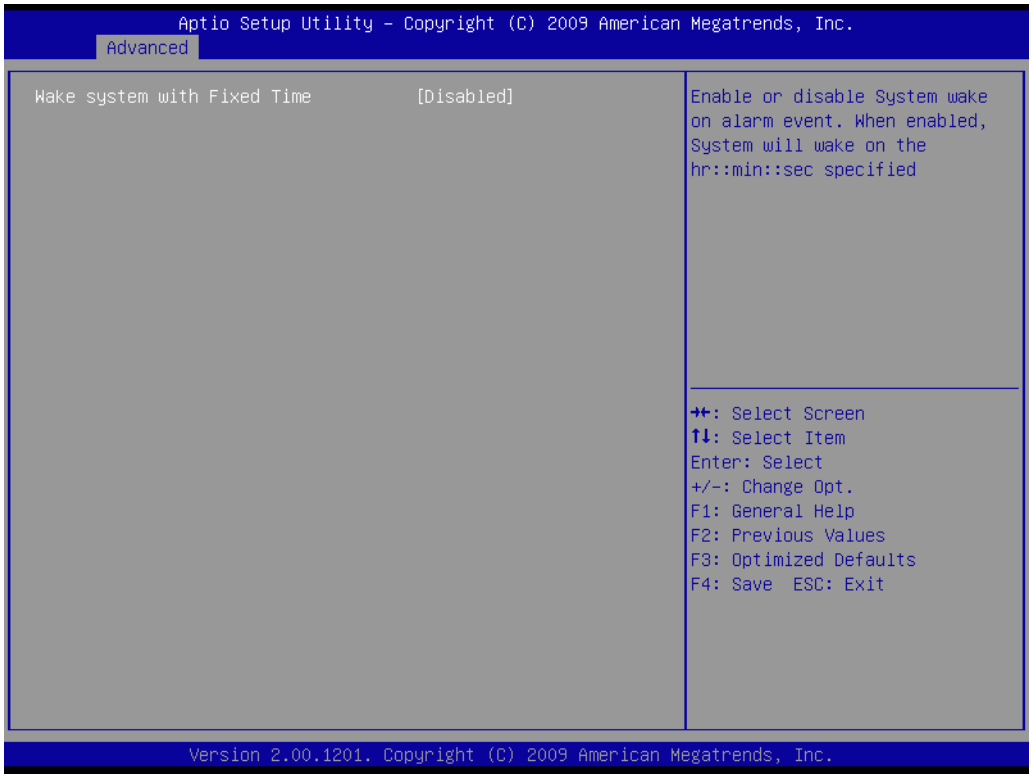
- **Extended Synch**
  If ENABLED, allows generation of Extended Synchronization patterns.

3.3.3 ACPI settings


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Enable ACPI Auto Configuration [Disabled]
Enable Hibernation [Enabled]
ACPI Sleep State [S3 (Suspend to R...]
PowerOn by Modem [Disabled]
Enables or Disables BIOS ACPI Auto Configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **Enable ACPI Auto Configuration**
  Enable or disable BIOS ACPI auto configuration
- **Enable Hibernation**
  Enable or Disable system ability to OS/S4 sleep state.
- **ACPI Sleep State**
  Select the highest ACPI sleep state the system will enter, when the Suspend button is pressed.
- **PowerOn by Modem**
  Allows the system to be awakened from an ACPI sleep state by a wake-up signal from a modem that supports wake-up function.

3.3.4 S5 RTC Wake Settings


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Wake system with Fixed Time [Disabled]
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **RTC Wake Settings**
  Determines whether to power on the system at a desired time. (Default: Disabled)

3.3.5 CPU Configuration

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
CPU Configuration
Processor Type Intel(R) Core(TM) i5 CPU
EMT64 Supported
Processor Speed 2394 MHz
Processor Stepping 20652
Microcode Revision 9
Processor Cores 2
Intel HT Technology Supported
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
Hardware Prefetcher [Enabled]
Adjacent Cache Line Prefetch [Enabled]
Intel Virtualization Technology [Disabled]
Power Technology [Energy Efficient]
TDC Limit 0
TDP Limit 0
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **Hyper-Threading**

  This item allows you to enable or disable Intel Hyper Threading technology.

- **Active Processor Cores**

  Allows you to choose the number of CPU cores to activate in each processor package.

- **Limit CPUID Maximum**

  This item allows you to limit CPUID maximum value.

- **Execute Disable Bit**

  This item allows you to enable or disable the No-Execution page protection technology.

- **Hardware Prefectch**

  The processor fetches data and instructions from the memory into the cache that are likely to be required in the near future. This reduces the latency associated with memory reads.

- **Intel Virtualization Technology**

  Intel Virtualization Technology (Intel VT) is a set of hardware enhancements to Intel server and client platforms that provide software-based virtualization solutions.

  Intel VT allows a platform to run multiple operating systems and applications in independent partitions, allowing one computer system can function as multiple virtual systems.

- **Power Technology**

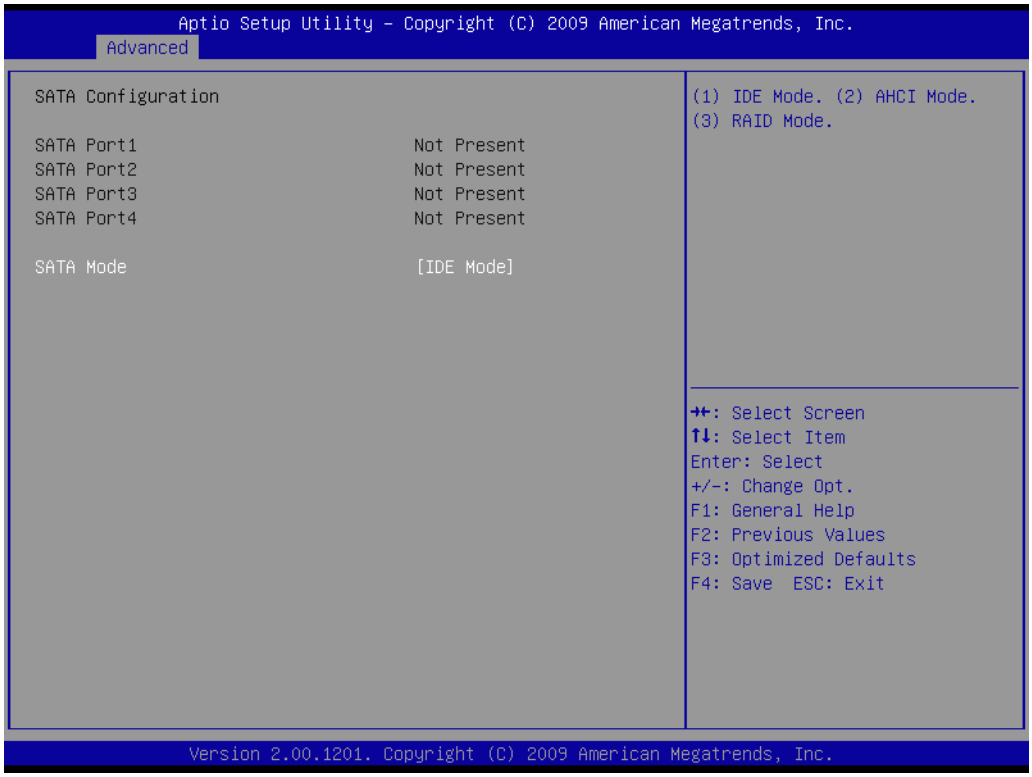
  Enable the power manager features.

- **TDC Limit**

  Turbo-XE Mode Processor TDC Limit in 1/8 A granularity. 0 means using the factory-configured value.

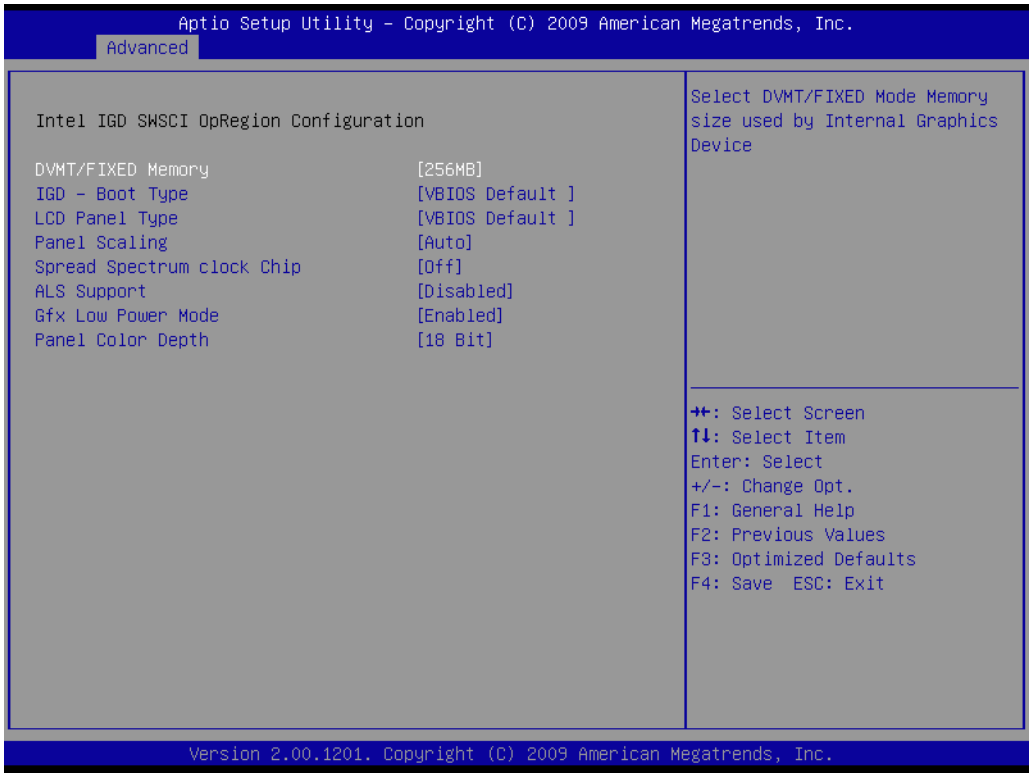
- **TDP Limit**
  Turbo-XE Mode Processor TDP Limit in 1/8 W granularity. 0 means using the factory-configured value.

3.3.6 SATA Configuration



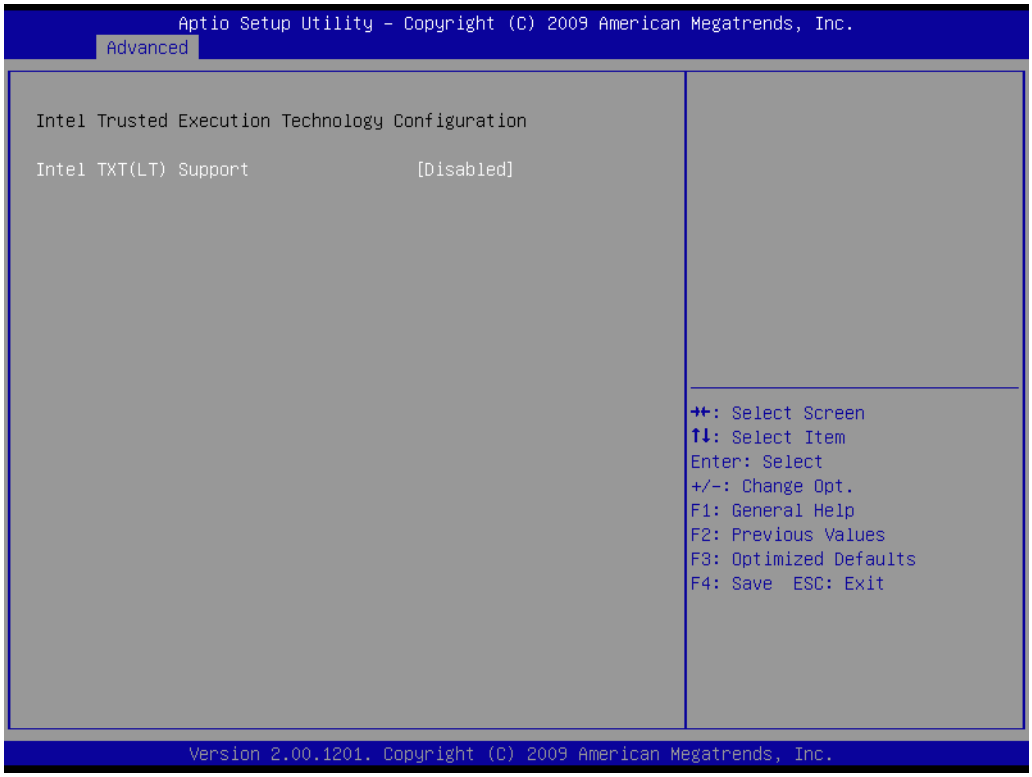
- **SATA Mode**
  This can be configured as IDE or AHCI mode.

3.3.7 Intel IGD SWSCI OpRegion


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Intel IGD SWSCI OpRegion Configuration
DVMT/FIXED Memory [256MB]
IGD - Boot Type [VBIOS Default]
LCD Panel Type [VBIOS Default]
Panel Scaling [Auto]
Spread Spectrum clock Chip [Off]
ALS Support [Disabled]
Gfx Low Power Mode [Enabled]
Panel Color Depth [18 Bit]
Select DVMT/FIXED Mode Memory size used by Internal Graphics Device
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

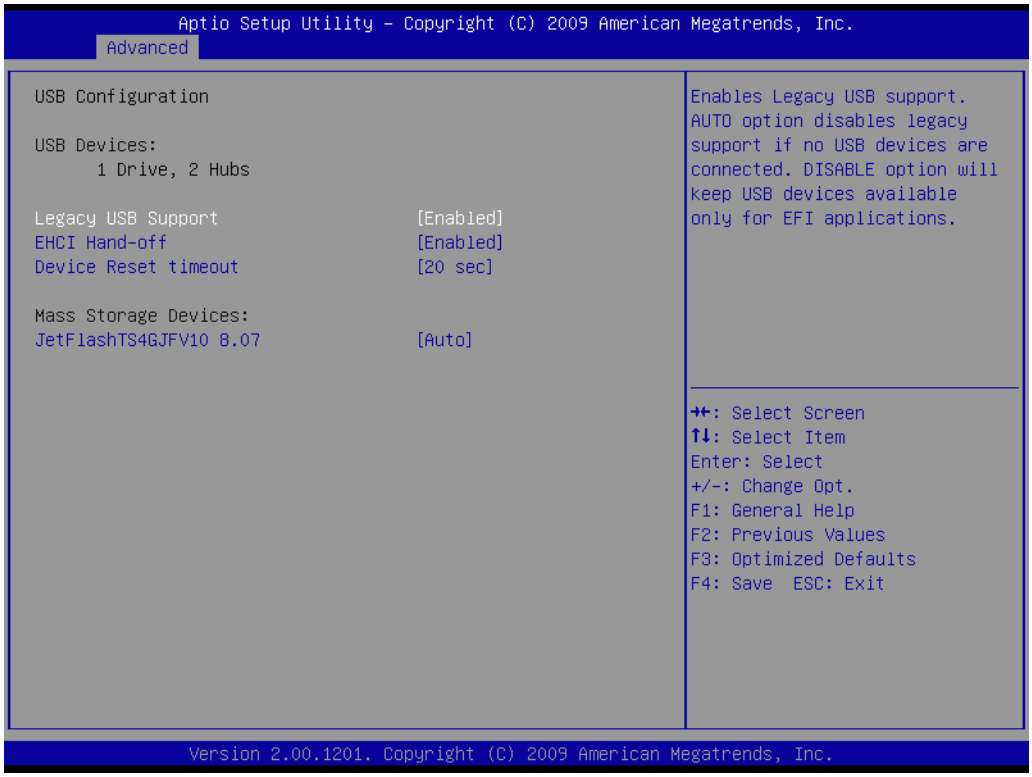
- **DVMT/FIXED Memory**
  Specifies the amount of DVMT / FIXED system memory to allocate for video memory.
- **IGD - Boot Type**
  Select the Video Device which will be activated during POST, this has no effect if external graphic does not present.
- **LCD Panel Type**
  Select LCD panel resolution used by the Internal Graphic Device.
- **Panel Scaling**
  Select the LCD panel scaling option used by the Internal Graphic Device.
- **Spread Spectrum Clock Chip**
  Select the spectrum control source.
- **ALS Support**
  Valid only for ACPI. Legacy = ALS Support through the IGD INT10 function. ACPI = ALS support through an ACPI ALS driver.
- **Gfx Low Power Mode**
  This option is applicable for SFF only.
- **Panel Color Depth**
  Select the LFP Panel Color Depth.

3.3.8 Intel TXT Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Intel Trusted Execution Technology Configuration
Intel TXT(LT) Support [Disabled]
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

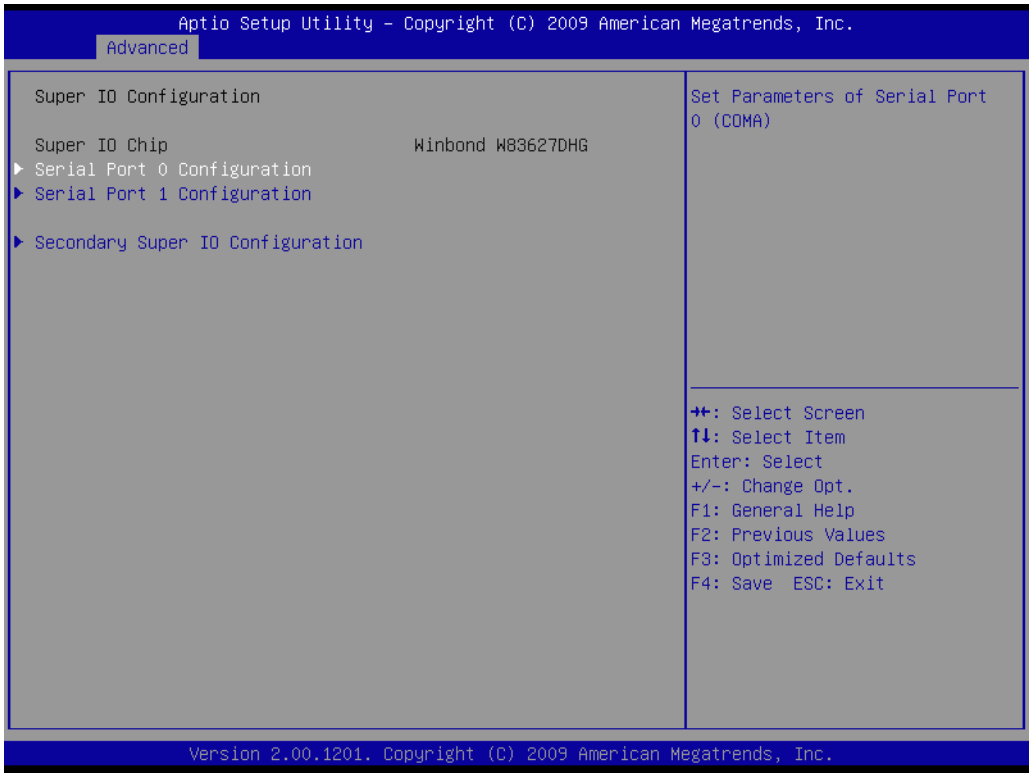
- **Intel TXT Configuration**
  This item allow you to enable or disable Intel Trusted Execution Technology

3.3.9 USB Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
1 Drive, 2 Hubs
Legacy USB Support [Enabled]
EHCI Hand-off [Enabled]
Device Reset timeout [20 sec]
Mass Storage Devices:
JetFlashTS4GJFV10 8.07 [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

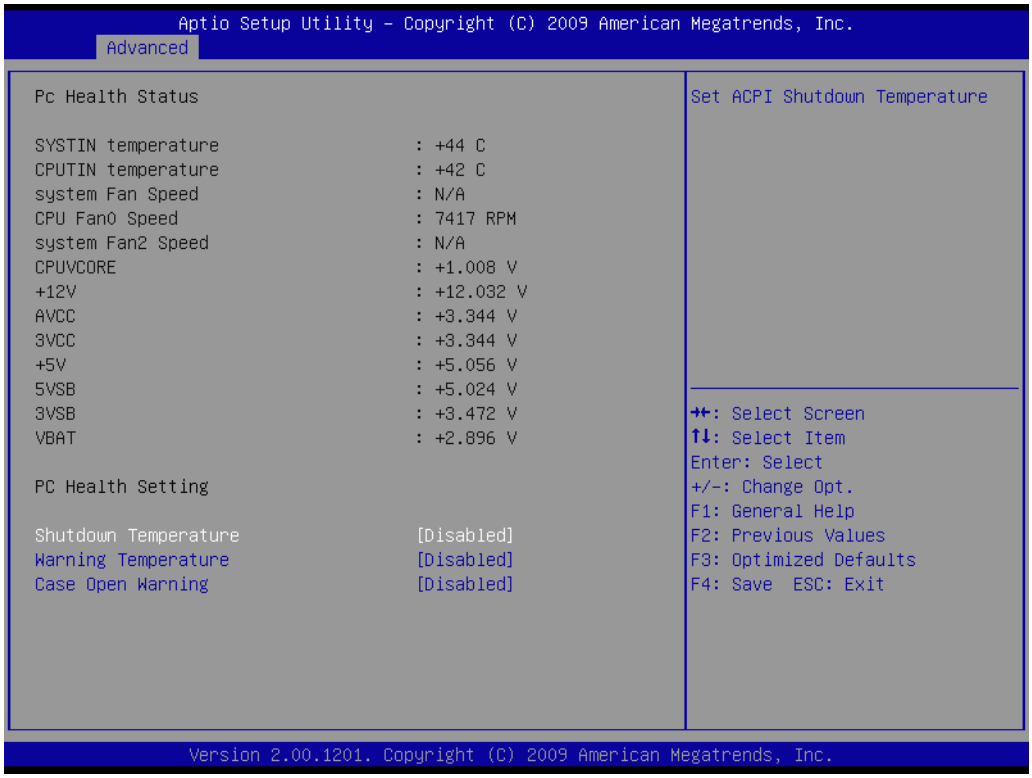
- **Legacy USB Support**
  Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-off**
  This is just a workaround item under OS without EHCI hand-off support.
- **Device Reset time out**
  USB mass storage device start unit command time out.
- **Mass Storage Devices**
  Show the USB mass storage device detail information.

3.3.10 Super IO Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Super IO Configuration
Super IO Chip Winbond W83627DHG
Serial Port 0 Configuration
Serial Port 1 Configuration
Secondary Super IO Configuration
Set Parameters of Serial Port 0 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **Serial Port 0/1 Configuration**
  Serial port 1/2 IRQ /IO/ mode resource configuration. Users can choose IRQ,IO and MODE.
- **Secondary Super IO Configuration**
  For secondary Super IO Fintek 81216 serial port 3/4/5/6 IRQ /IO/ mode resource configuration. Users can choose IRQ,IO and MODE.

3.3.11 H/W Monitor


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Pc Health Status
SYSTIN temperature : +44 C
CPUTIN temperature : +42 C
system Fan Speed : N/A
CPU Fan0 Speed : 7417 RPM
system Fan2 Speed : N/A
CPUVCORE : +1.008 V
+12V : +12.032 V
AVCC : +3.344 V
3VCC : +3.344 V
+5V : +5.056 V
5VSB : +5.024 V
3VSB : +3.472 V
VBAT : +2.896 V
PC Health Setting
Shutdown Temperature [Disabled]
Warning Temperature [Disabled]
Case Open Warning [Disabled]
Set ACPI Shutdown Temperature
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **Shutdown Temperature**

  This potion allows user to set the CPU temperature at which the system will automatically shut down to prevent CPU overheat damage.

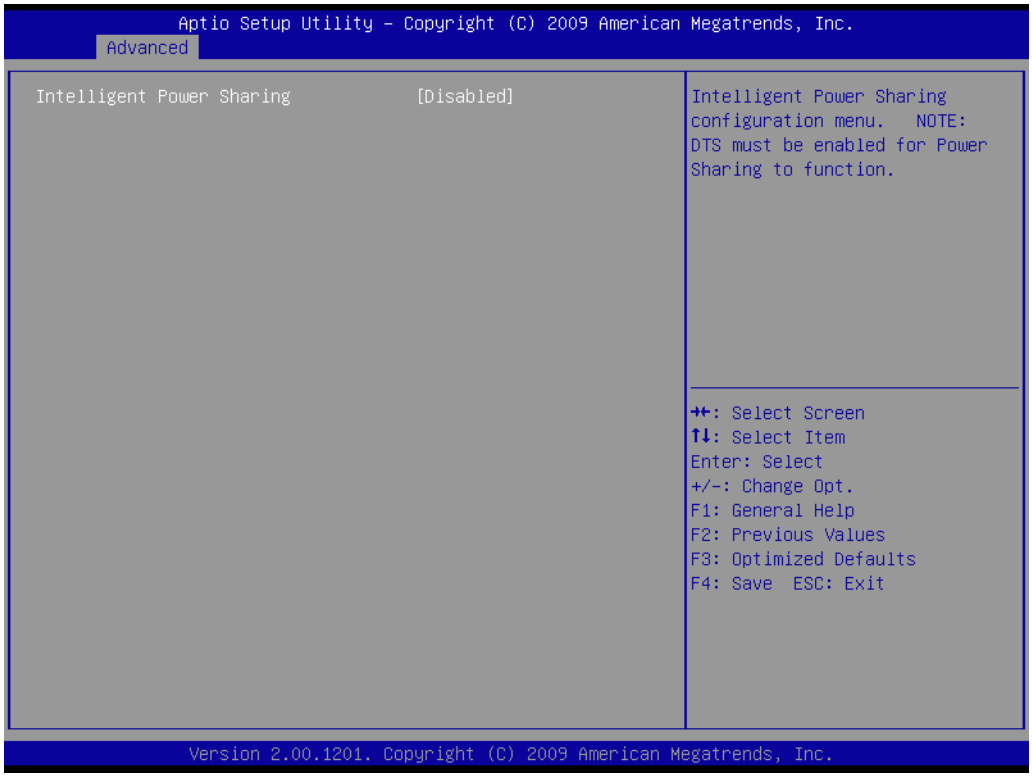
- **Warning Temperature**

  Use this to set the CPU warning temperature threshold. When the system CPU reaches the warning temperature, the buzzer will beep.

- **Case open Warning**

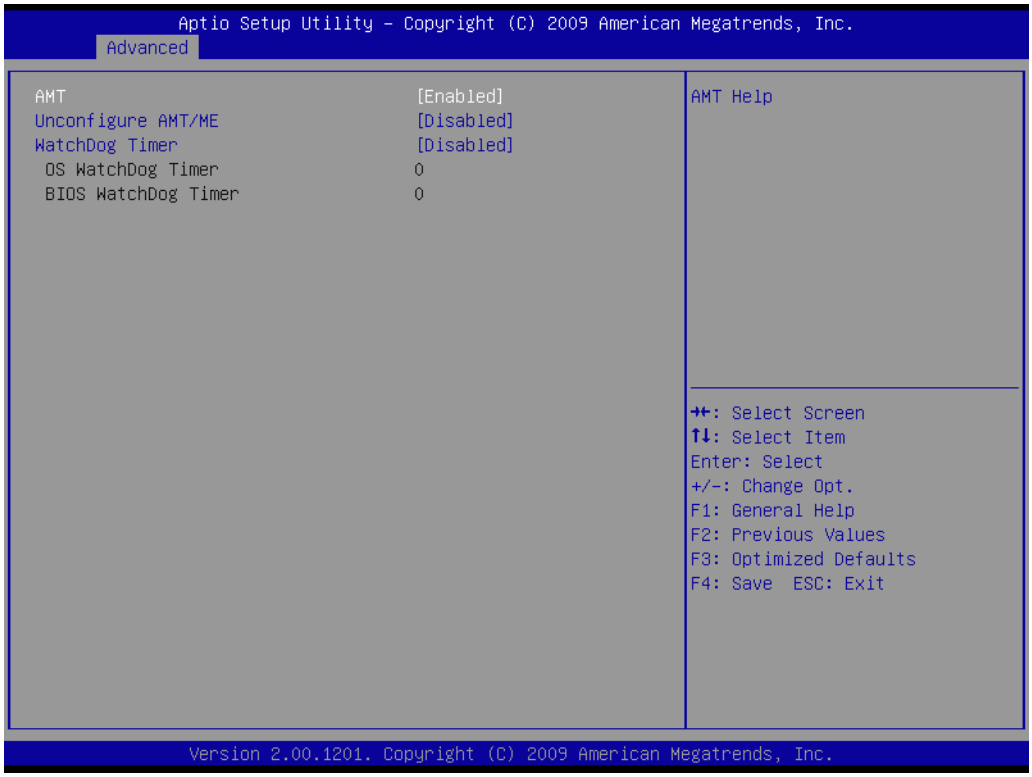
  To show warning message beep sound when case been opened.

3.3.12 Intelligent Power Sharing


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
Intelligent Power Sharing [Disabled]
Intelligent Power Sharing configuration menu. NOTE: DTS must be enabled for Power Sharing to function.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

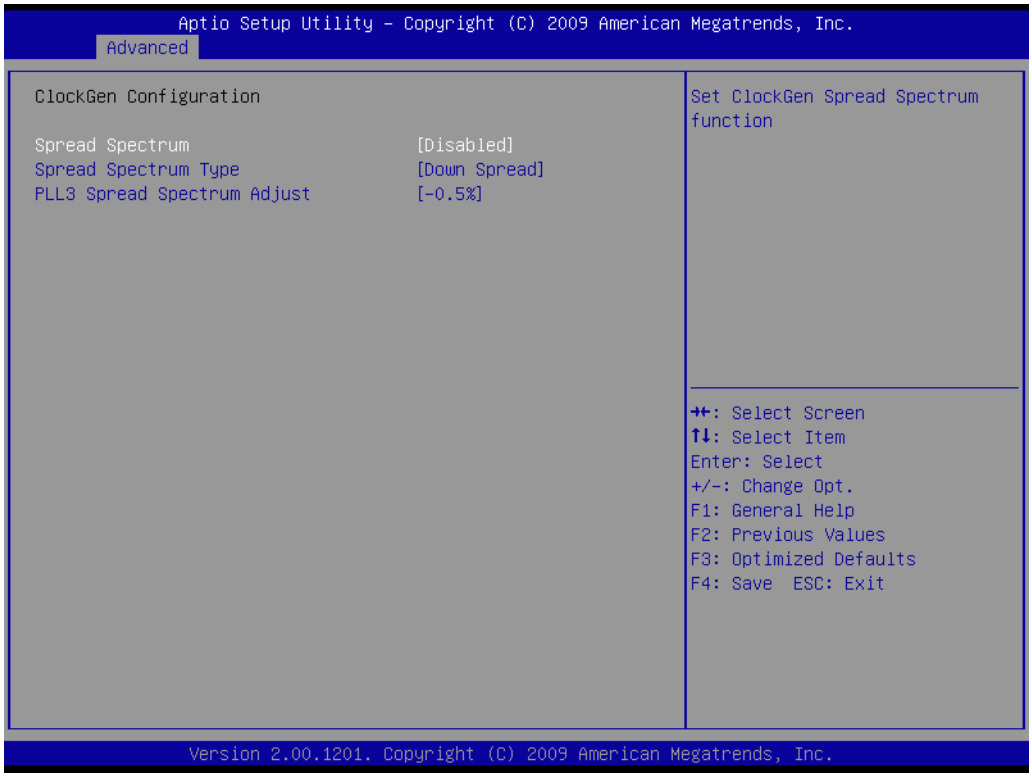
- **Intelligent Power Sharing**
  This item allows you to enable or disable Intelligent Power Sharing function.

3.3.13 AMT Configuration



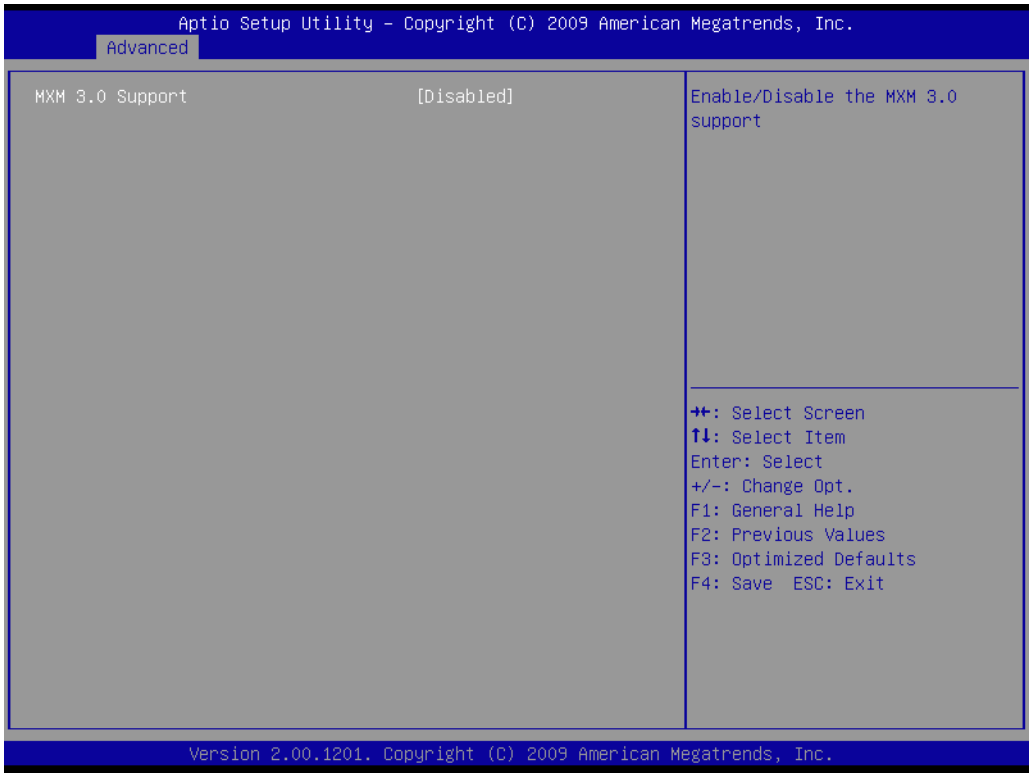
- **AMT**
  Intel Active Management Technology (AMT) is hardware-based technology for remotely managing and securing PCs out-of-band.
- **Unconfigure AMT/ME**
  Unconfigure AMT/ME setting.
- **WatchDog Timer**
  Enable/Disable the watchdog timer.

3.3.14 ClockGen Configuration



- **Spread Spectrum**
  Set ClockGen Spread Spectrum function.
- **Spread Spectrum Type**
  Spread Spectrum type select: Down Spread or Center Spread.
- **PLL3 Spread Spectrum Adjust**
  Adjust PLL3 Spread Spectrum setting.

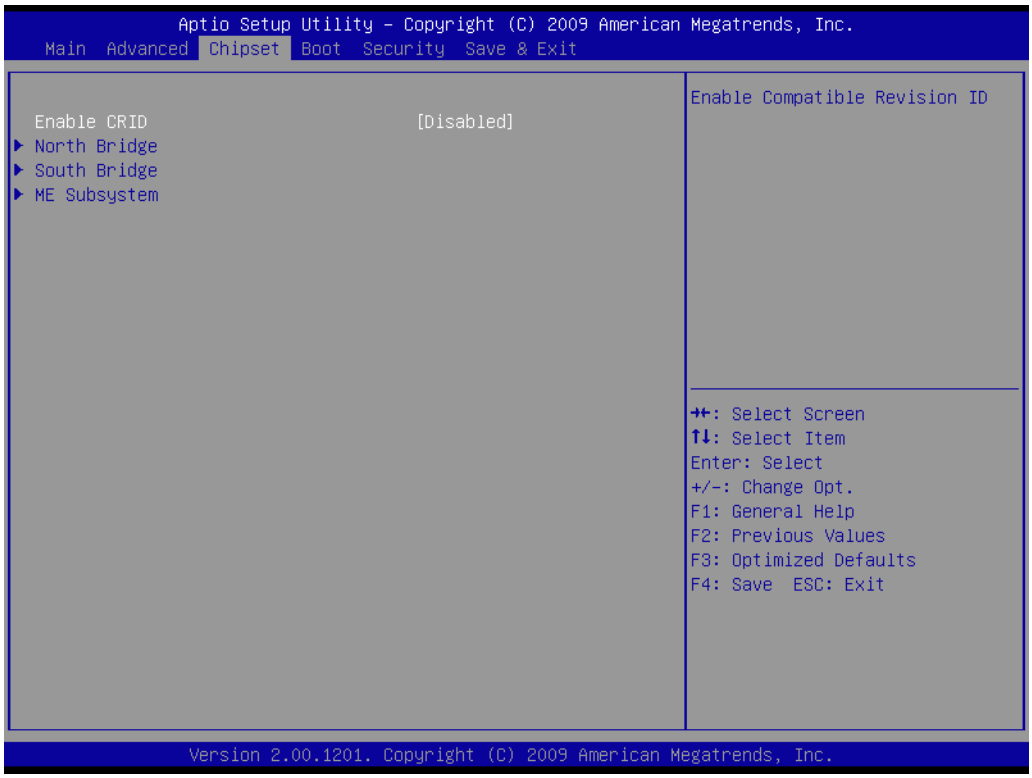
3.3.15 MXM 3.0/Hybrid Graphics


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Advanced
MXM 3.0 Support [Disabled]
Enable/Disable the MXM 3.0 support
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

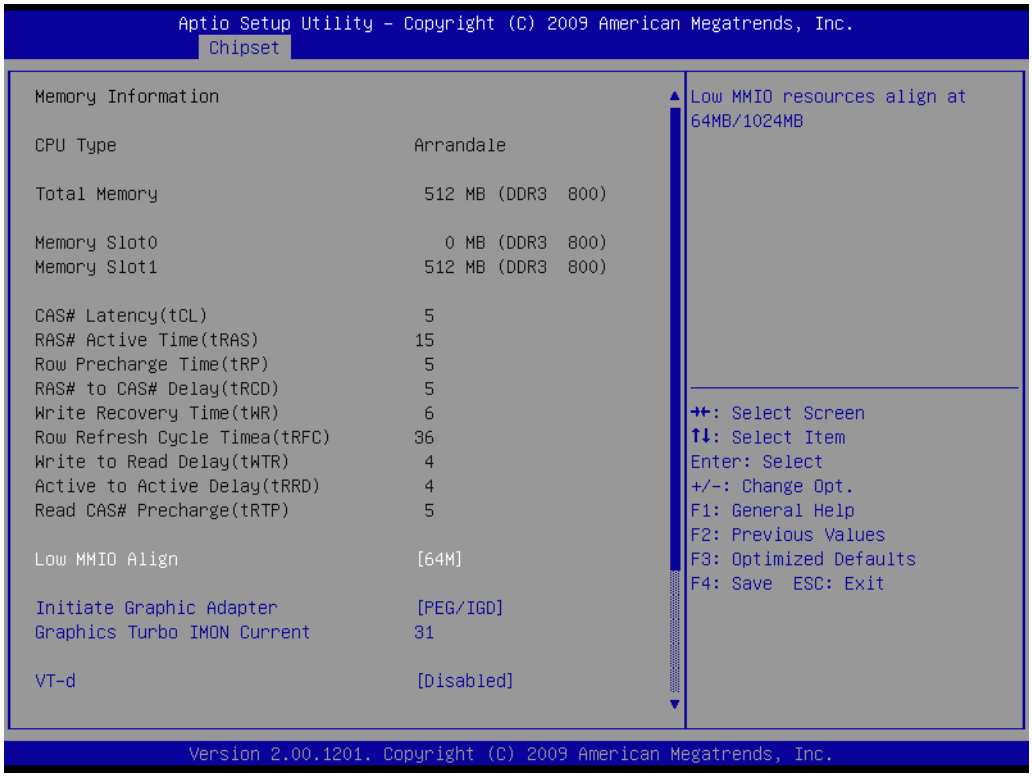
- **MXM 3.0 Support**
  This item allows you to enable or disable MXM 3.0 support

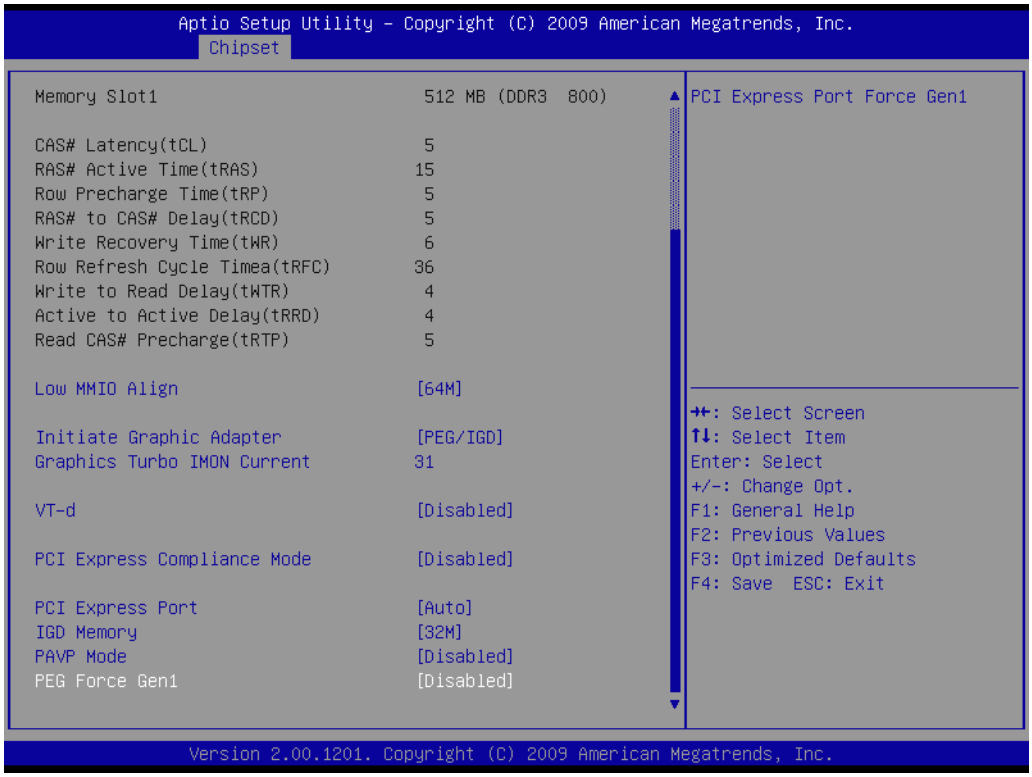
3.4 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI express Configuration, to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.



3.4.1 North Bridge Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Chipset
Memory Information
CPU Type Arrandale
Total Memory 512 MB (DDR3 800)
Memory Slot0 0 MB (DDR3 800)
Memory Slot1 512 MB (DDR3 800)
CAS# Latency(tCL) 5
RAS# Active Time(tRAS) 15
Row Precharge Time(tRP) 5
RAS# to CAS# Delay(tRCD) 5
Write Recovery Time(tWR) 6
Row Refresh Cycle Timea(tRFC) 36
Write to Read Delay(tWTR) 4
Active to Active Delay(tRRD) 4
Read CAS# Precharge(tRTP) 5
Low MMIO Align [64M]
Initiate Graphic Adapter [PEG/IGD]
Graphics Turbo IMON Current 31
VT-d [Disabled]
Low MMIO resources align at 64MB/1024MB
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Chipset
Memory Slot1 512 MB (DDR3 800)
CAS# Latency(tCL) 5
RAS# Active Time(tRAS) 15
Row Precharge Time(tRP) 5
RAS# to CAS# Delay(tRCD) 5
Write Recovery Time(tWR) 6
Row Refresh Cycle Timea(tRFC) 36
Write to Read Delay(tWTR) 4
Active to Active Delay(tRRD) 4
Read CAS# Precharge(tRTP) 5
Low MMIO Align [64M]
Initiate Graphic Adapter [PEG/IGD]
Graphics Turbo IMON Current 31
VT-d [Disabled]
PCI Express Compliance Mode [Disabled]
PCI Express Port [Auto]
IGD Memory [32M]
PAVP Mode [Disabled]
PEG Force Gen1 [Disabled]
PCI Express Port Force Gen1
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
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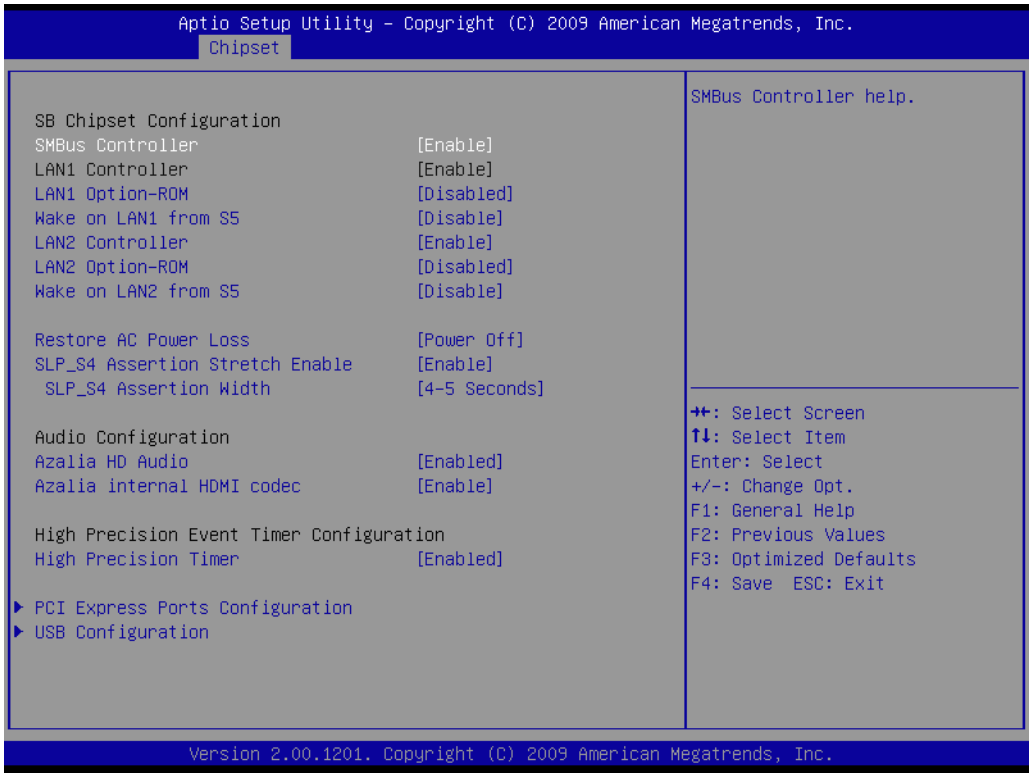
- **Low MMIO Align**
  Low MMIO resource align at 64MB/1024MB.
- **Initiate Graphic Adapter**
  This item allows you to select which graphics controller to use as the primary boot device.

- **Graphics Turbo IMON Current**
  Graphics turbo IMON current values supported (14-31)
- **VT-d**
  To support Intel chipset virtualization technology for directed I/O.
- **PCI Express Compliance mode**
  Disable /Enable the compliance mode.
- **PCI Express Port**
  Disable /Enable the Northbridge PCI express ports.
- **IGD Memory**
  Set internal graphic shared memory size (32M / 64M / 128M).
- **PAVP Mode**
  Select the PAVP mode used by the internal graphics device.
- **PEG Force Gen1**
  Disable /Enable the PEG Force Gen1.

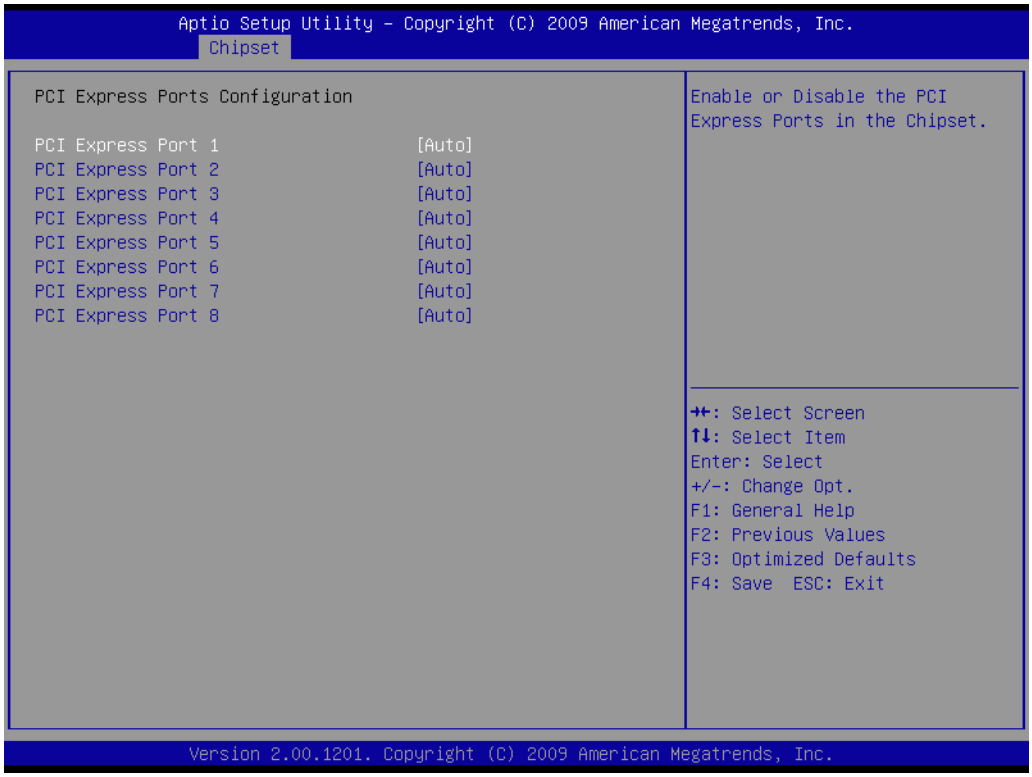
3.4.2 South Bridge Configuration



- **SMBus Controller**
  Disable/enable the system SMBUS function.
- **LAN1 Controller**
  Enables or disables the GbE controller.
- **LAN1 Option-ROM**
  Enables or disables GbE LAN boot.
- **Wake on LAN1 from S5**
  Enables or disables GbE LAN wake up from S5 function.
- **LAN2 Controller**
  Enables or disables the GbE controller.

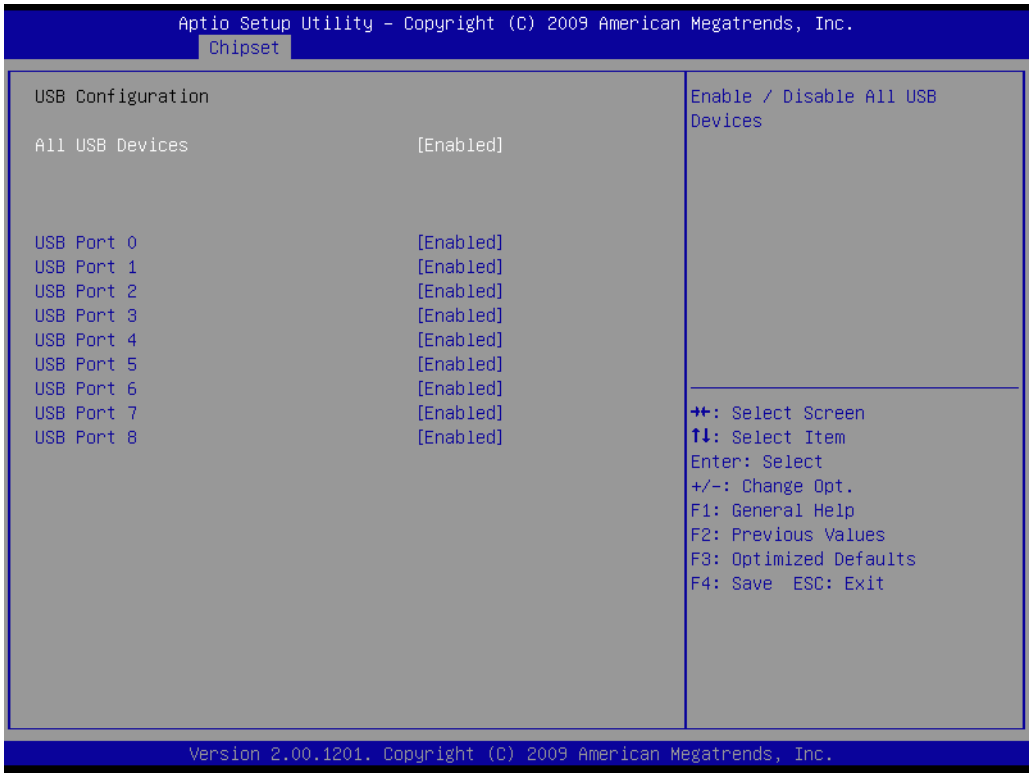
- **LAN2 Option-ROM**
  Enables or disables GbE LAN boot.
- **Wake on LAN2 from S5**
  Enables or disables GbE LAN wake up from S5 function.
- **Restore AC Power Loss**
  The system goes into on/off state after an AC power loss.
- **SLP_S4 Assertion Stretch Enable**
  This item allows you to set a delay of a set number of seconds.
- **Azalia HD Audio**
  Enables or disables the HD Audio controller.
- **Azalia internal HDMI codec**
  Enables or disables the internal HDMI codec.
- **High Precision Timer**
  Enables or disables High Precision Event Timer (HPET)

3.4.3 PCI Express Ports Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Chipset
PCI Express Ports Configuration
PCI Express Port 1 [Auto]
PCI Express Port 2 [Auto]
PCI Express Port 3 [Auto]
PCI Express Port 4 [Auto]
PCI Express Port 5 [Auto]
PCI Express Port 6 [Auto]
PCI Express Port 7 [Auto]
PCI Express Port 8 [Auto]
Enable or Disable the PCI Express Ports in the Chipset.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

- **PCI Express Ports Configuration**
  Disable / Enable the PCI Express ports.

3.4.4 USB Configuration


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Chipset
USB Configuration
All USB Devices [Enabled]
USB Port 0 [Enabled]
USB Port 1 [Enabled]
USB Port 2 [Enabled]
USB Port 3 [Enabled]
USB Port 4 [Enabled]
USB Port 5 [Enabled]
USB Port 6 [Enabled]
USB Port 7 [Enabled]
USB Port 8 [Enabled]
Enable / Disable All USB Devices
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
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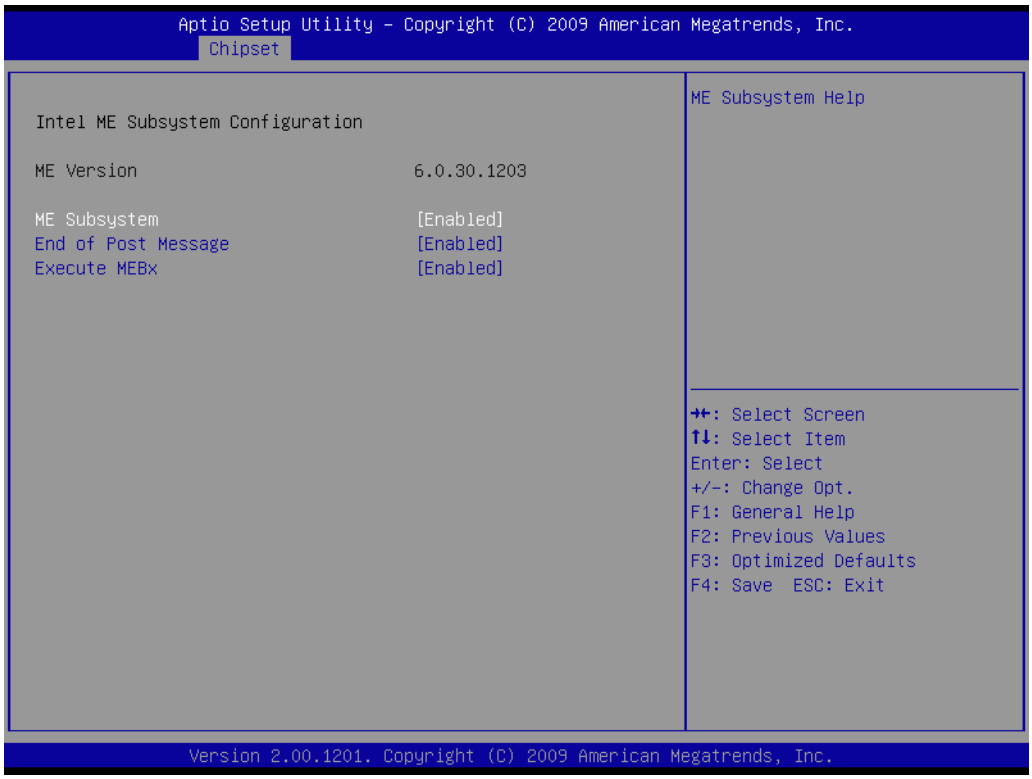
- **USB Configuration**

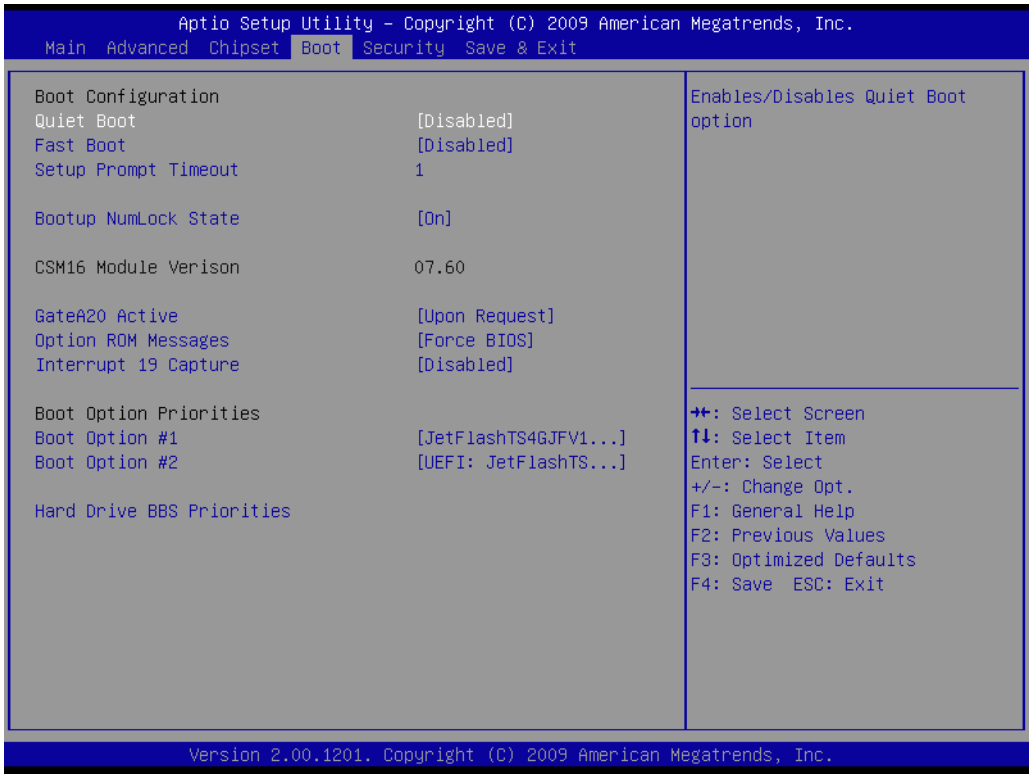
  Disable / Enable the USB controller (EHCI #1) and (EHCI #2) and allow users to disable/ enable USB ports.

3.4.5 Intel ME Subsystem Configuration



- **ME Version**
  The ME version information.
- **ME Subsystem**
  Disable / Enable the ME function.
- **End of Post Message**
  Disable / Enable the end of post message
- **Execute MEBx**
  Enable / Disable ME MEBx BIOS ROM.

3.5 Boot Setting


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Quiet Boot [Disabled]
Fast Boot [Disabled]
Setup Prompt Timeout 1
Bootup NumLock State [On]
CSM16 Module Verison 07.60
GateA20 Active [Upon Request]
Option ROM Messages [Force BIOS]
Interrupt 19 Capture [Disabled]
Boot Option Priorities
Boot Option #1 [JetFlashTS4GJFV1...]
Boot Option #2 [UEFI: JetFlashTS...]
Hard Drive BBS Priorities
Enables/Disables Quiet Boot option
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
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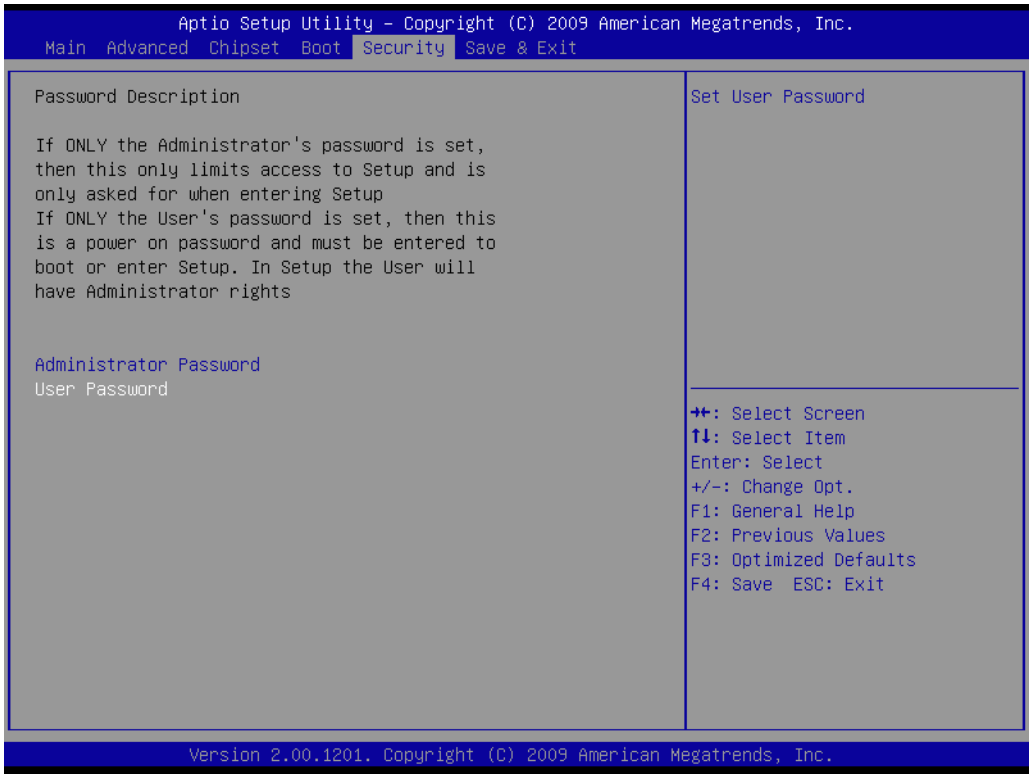
- **Quiet Boot**
  If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **Fast Boot**
  This item allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
- **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key. (65535 means indefinite waiting)
- **Bootup Numlock State**
  When "ON", the keyboard num lock state will stay "ON" after booting.
  When "OFF", the keyboard num lock state will stay "OFF" after booting.
- **Option ROM Message**
  Set display mode for Option ROM
- **GateA20 Active**
  UPON REQUEST: GA20 can be disabled using BIOS services.
  Always: do not allow disabled GA20
- **Interrupt19 Capture:**
  Enable/disable option for ROM to trap int 19.
- **Boot Option Priority**
  Boot Option #1
  Boot Option #2
  Show the boot device choices.
- **Hard Drive BBS Priorities:**
  Select the main hard disk device type to be a boot hard drive.

3.6 Security Setting


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights
Administrator Password
User Password
Set User Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.

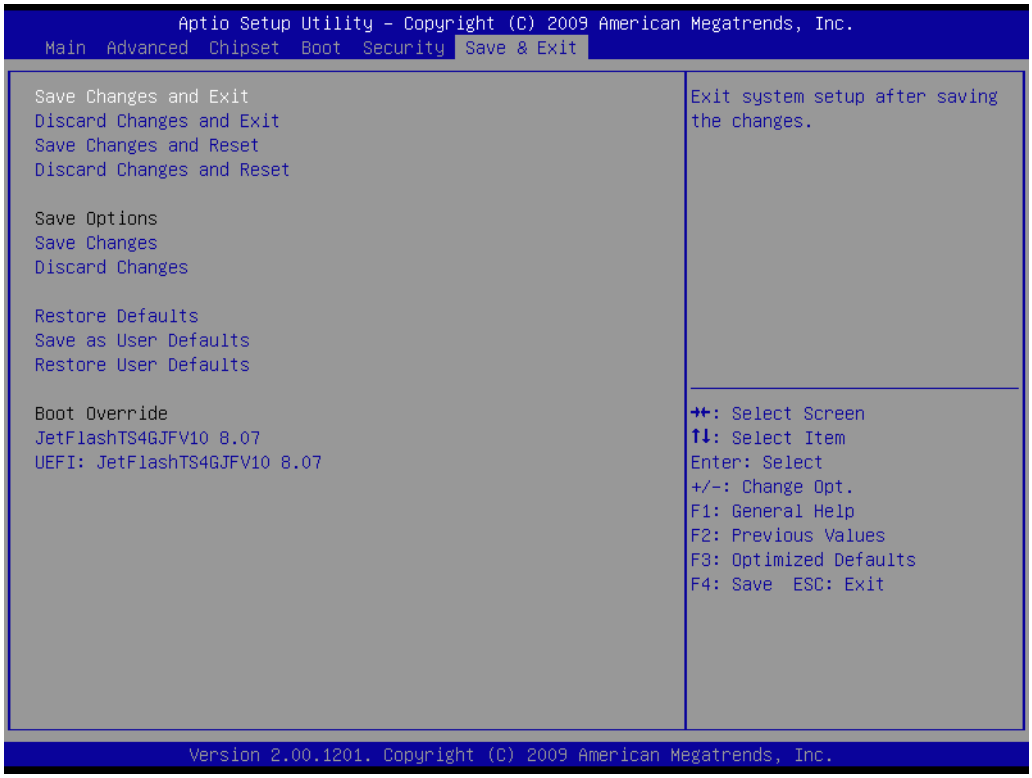
- **Administrator Password**

  Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the Administrator password.

- **User Password**

  Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the User password.

3.7 Save & Exit Configuration



- **Save Changes and Exit**

  When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select Ok or cancel.

- **Discard Changes and Exit**

  Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select Ok to discard changes and exit. Discard Changes
   Select Discard Changes from the Exit menu and press <Enter>.

- **Restore Default**

  The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

- **Save as User Default**

  Save the all current settings as a user default.

- **Restore User Default**

  Restore all settings to user default values.

- **Boot Override**

  Shows the boot device types on the system.

Chapter 4

Software Introduction & Service

4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

GPIO

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provide Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus

SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Display

Brightness Control

The Brightness Control API allows a developer to access embedded devices and easily control brightness.

Backlight

The Backlight API allows a developer to control the backlight (screen) on/off in embedded devices.

4.2.1.3 Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

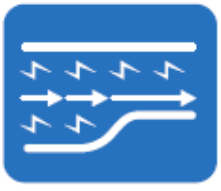
The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

4.2.1.4 Power Saving

CPU Speed

Makes use of Intel SpeedStep technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

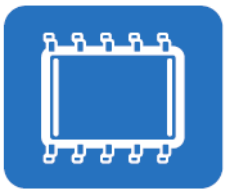
System Throttling



Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

BIOS Flash



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easy to be copied! Embedded Security ID utility which provides reliable security functions for customers to secure their application data within embedded BIOS.

Monitoring

The Monitoring is a utility for customer to monitor the system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if the critical errors occur and are not solved immediately, permanent damage may be caused.

eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to the designated administrator. The eSOS also provide for remote connection via Telnet server and FTP server so the administrator can attempt to rescue the system. Note: This function requires BIOS customization.

Chapter 5

Chipset Software Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-270 are located on the software installation CD. The driver in the folder of the driver CD will guide and link you to the utilities and drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.

Note! *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

5.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

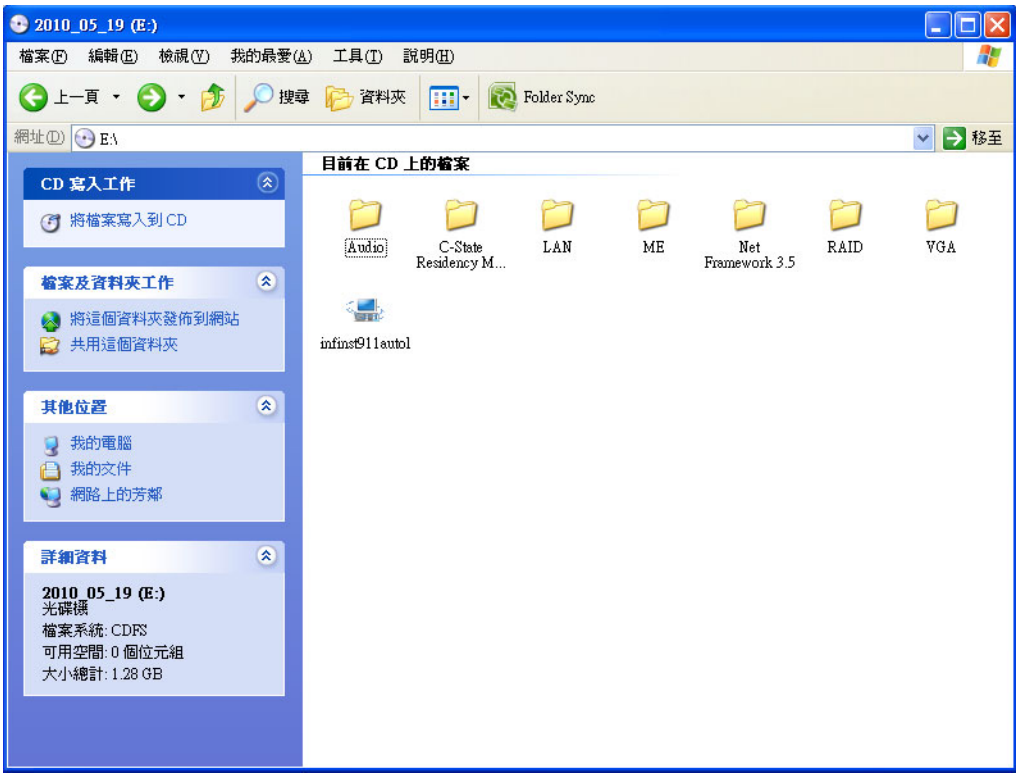
- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Win98)
- Identification of Intel® chipset components in the Device Manager

Note! *This utility is used for the following versions of Windows, and it has to be installed **before** installing all the other drivers:*

- *Windows 7 (32-bit)*
- *Windows 7 (64-bit)*
- *Windows XP professional edition (32-bit)*
- *Windows XP professional edition (64-bit)*

5.3 Windows XP/Windows 7 Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "Chipset" folder and click "infinst_autol.exe" to complete the installation of the driver.



Chapter 6

VGA Setup

6.1 Introduction

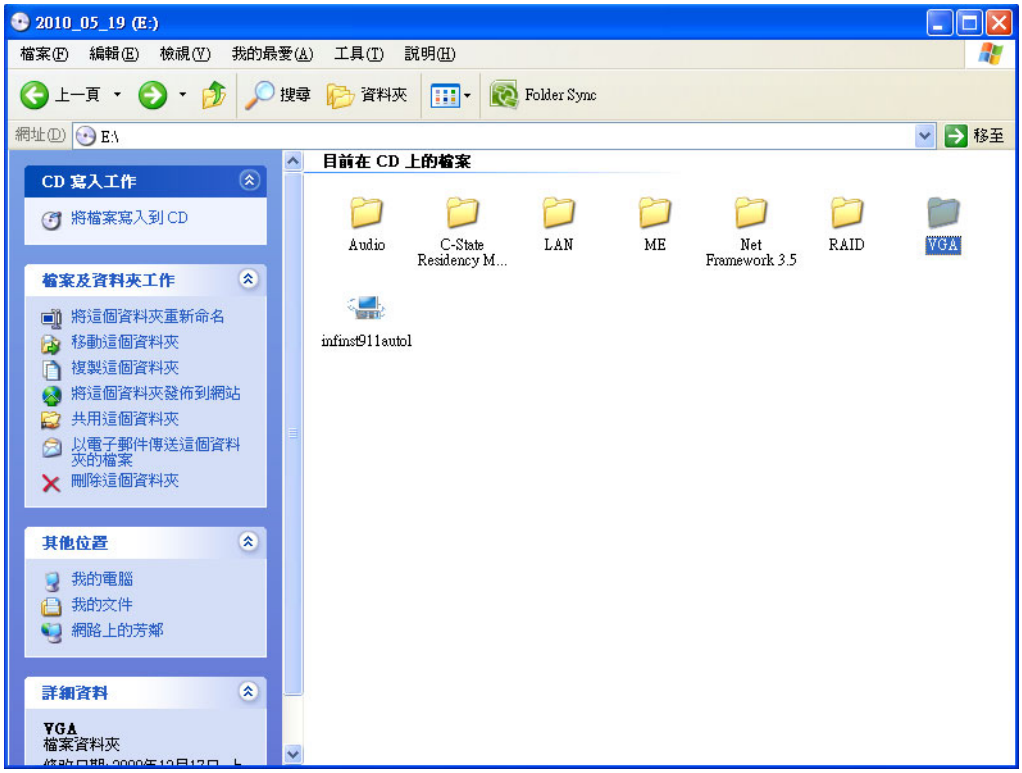
The Intel mobile Core i7-620M, Core i5-520M and Celeron P4500 CPUs with dual core are embedded with an integrated graphics controller. You need to install the VGA driver to enable the function.

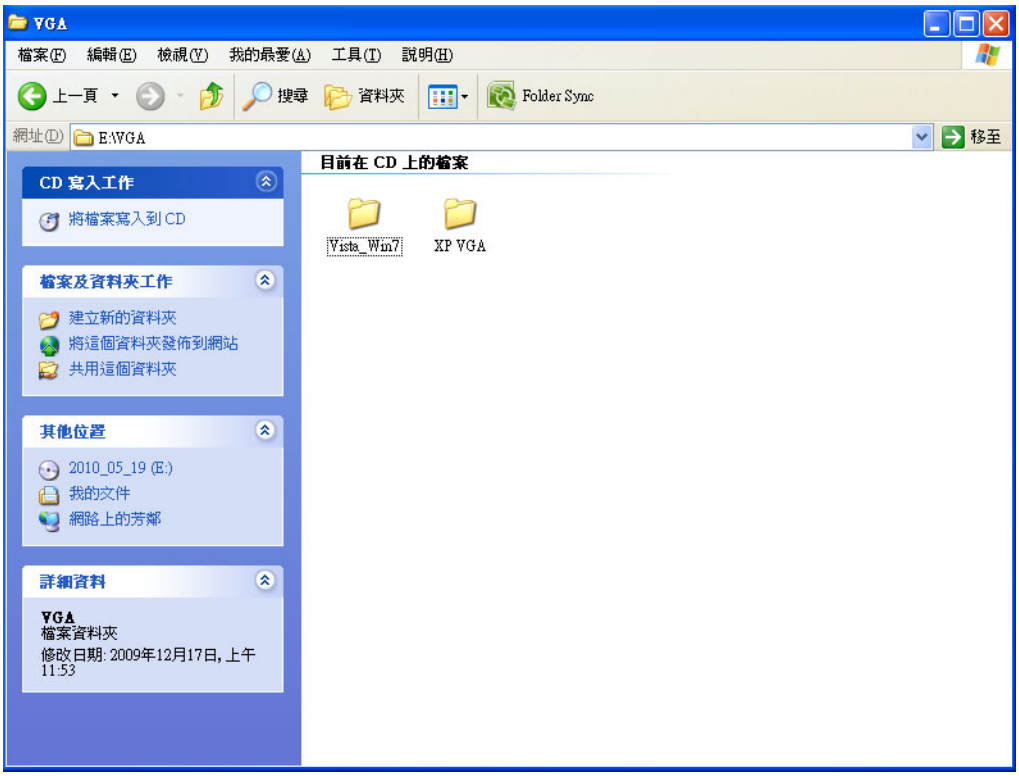
Optimized integrated graphic solution: With Intel Graphics Flexible, it supports versatile display options and 32-bit 3D graphics engine. Dual independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone dual display mode, and optimized 3D support deliver an intensive and realistic visual experience.

6.2 Windows 7/Vista/XP

Note! *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.*

Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the "VGA" folder and click "setup.exe" to complete the installation of the drivers for Windows 7, Windows Vista, Windows XP.




VGA
檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)
上一頁 搜尋 資料夾 Folder Sync
網址(D) E:\VGA
移至
CD 寫入工作
將檔案寫入到 CD
檔案及資料夾工作
建立新的資料夾
將這個資料夾發佈到網站
共用這個資料夾
其他位置
2010_05_19 (E:)
我的文件
網路上的芳鄰
詳細資料
VGA
檔案資料夾
修改日期: 2009年12月17日, 上午 11:53
目前在 CD 上的檔案
Vista_Win7
XP VGA

Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-270 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel 82577LM (LAN1) and 82583V (LAN2)) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

7.2 Features

- Integrated 10/100/1000 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

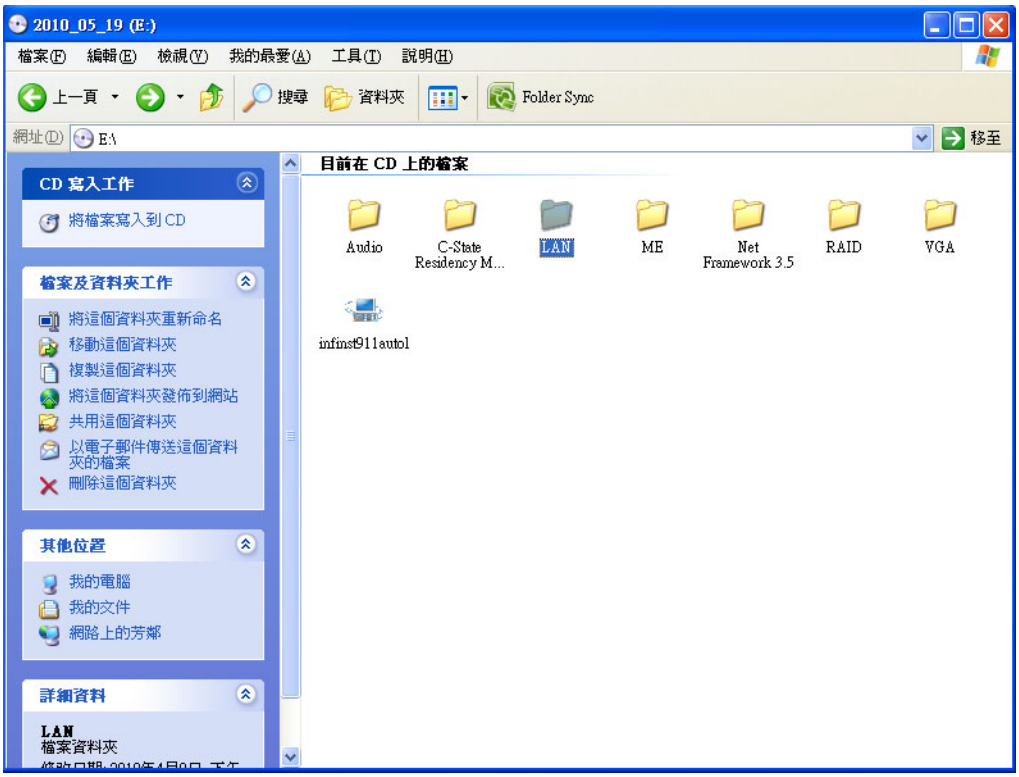
7.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*

The AIMB-270's Intel 82577LM (LAN1) and 82583V (LAN2) Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies from system to system. Please find and use the section that provides the driver setup procedure for the operating system you are using.

7.4 Windows® 7/Vista/XP Driver Setup (Intel 82577LM/82583V)

Insert the driver CD into your system's CD-ROM drive. Select the LAN folder then navigate to the directory for your OS.



Appendix A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The AIMB-270's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog Timer Overview

The watchdog timer is built into the super I/O controller W83627DHG-P. It provides the following user-programmable functions:

- Can be enabled and disabled by user program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.1.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first assign the address of register by writing an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

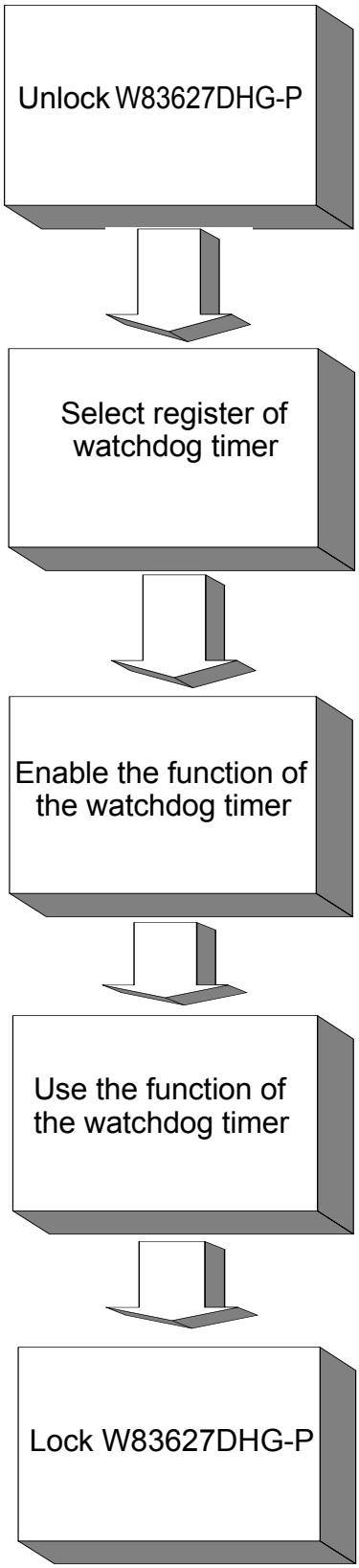

Unlock W83627DHG-P
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock W83627DHG-P

Table A.1: Watchdog Timer Registers		
Address of Register (2E)	**Attribute**	
Read/Write	Value (2F) & description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627DHG-P.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set second as counting unit. [default] Write 1 to bit 3: set minutes as counting unit.
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 7:Write 1 to enable mouse to reset the timer, 0 to disable[default]. Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is “timeout”.
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.1.3 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
Mov al,87h
Out dx,al
Out dx,al
;----------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;----------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;----------------------------------------------------------
Dec dx ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;----------------------------------------------------------
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;----------------------------------------------------------
Dec dx ; Lock W83627DHG-P
Mov al,0aah
Out dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
Mov al,87h
Out dx,al
Out dx,al
```

```
;------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------
Dec dx ; Set minute as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;------------------------------------------------------
Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5
Out dx,al
;------------------------------------------------------
Dec dx ; Lock W83627DHG-P
Mov al,0aah
Out dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------
```

```
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;--------------------------------------------------------
Dec dx ; Lock W83627DHG-P
Mov al,0aah
Out dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;--------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
```

```
;--------------------------------------------------------
Dec dx ; Lock W83627DHG-P
Mov al,0aah
Out dx,al
```

5. Generate a time-out signal without timer counting

```
;--------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;--------------------------------------------------------
Dec dx ; Lock W83627DHG-P
Mov al,0aah
Out dx,al
```

Appendix B

I/O Pin Assignments

B.1 USB Header (USB56, USB78)

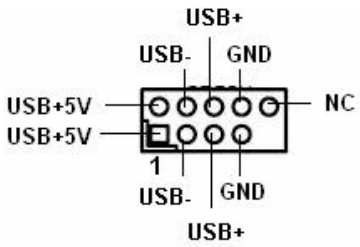


Table B.1: USB Header (USB56)

Pin	Signal	Pin	Signal
1	USB0_VCC5	2	USB1_VCC5
3	USB0_D-	4	USB1_D-
5	USB0_D+	6	USB1_D+
7	GND	8	GND
9	Key	10	GND

B.2 VGA Connector (VGA1)

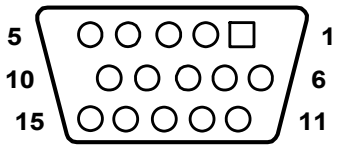


Table B.2: VGA Connector (VGA1)

Pin	Signal	Pin	Signal
1	RED	9	CRT_VCCIN
2	VGA_G	10	GND
3	VGA_B	11	N/C
4	N/C	12	V_SDAT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	V_SCLK

B.3 SPI_CN1: SPI Fresh Card Pin Connector

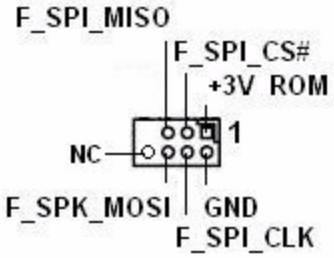


Table B.3: SPI_CN1:SPI Fresh Card Pin Connector

Pin	Signal	Pin	Signal
1	+F1_3V	2	GND
3	F1_SPI_CS#_Q	4	F1_SPI_CLK_Q
5	F1_SPI_MISO_Q	6	F1_SPI_MOSI_Q
7	NC	8	NC

B.4 PS/2 Keyboard and Mouse Connector (KBMS1)

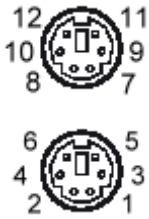


Table B.4: PS/2 Keyboard and Mouse Connector (KBMS1)

Pin	Signal
1	KB DATA
2	N/C
3	GND
4	KB VCC
5	KB CLK
6	N/C
7	M_DATA
8	N/C
9	GND
10	M_VCC
11	M_CLK
12	N/C

B.5 RS-232 Interface (COM3/4/5/6)

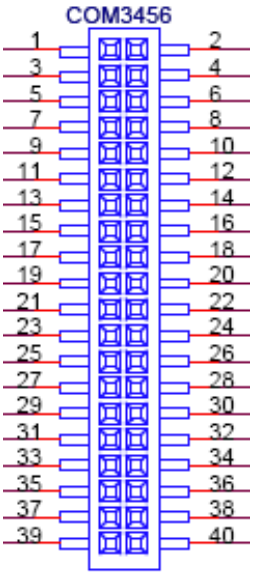


Table B.5: RS-232 Interface (COM4~COM6)

Pin	Signal	Pin	Signal
1	DCD_3	2	DSR_3
3	RXD_3	4	RTS_3
5	TXD_3	6	CTS_3
7	DTR_3	8	RRI_3
9	GND_3	10	GND_3
11	DCD_4	12	DSR_4
13	RXD_4	14	RTS_4
15	TXD_4	16	CTS_4
17	DTR_4	18	RRI_4
19	GND_4	20	GND_4
21	DCD_5	22	DSR_5
23	RXD_5	24	RTS_5
25	TXD_5	26	CTS_5
27	DTR_5	28	RRI_5
29	GND_5	30	GND_5
31	DCD_6	32	DSR_6
33	RXD_6	34	RTS_6
35	TXD_6	36	CTS_6
37	DTR_6	38	RRI_6
39	GND_6	40	GND_6

B.6 CPU Fan Power Connector (CPU_FAN1)

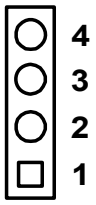


Table B.6: CPU Fan Power Connector (CPU_FAN1)	
Pin	**Signal**
1	GND
2	+12 V
3	DETECT
4	PWM

B.7 System Fan Power Connector (SYS_FAN1/2)

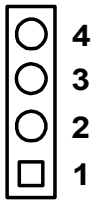


Table B.7: System Fan Power Connector (SYSFAN1/SYSFAN2)	
Pin	**Signal**
1	GND
2	+12 V
3	DETECT
4	PWM

B.8 Power LED & Keyboard Lock Connector (JFP2)

You can use an LED to indicate when the single board computer is on. Pin 1 of JFP3 supplies the LED's power, and Pin 3 is the ground.

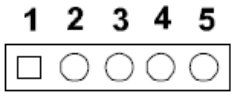


Table B.8: Power LED & Keyboard Lock Connector (JFP2)

Pin	Function
1	LED power
2	NC
3	GND
4	KEYLOCK#
5	GND

B.9 Power switch/HDD LED/SMBus/Speaker (JFP1)

The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.

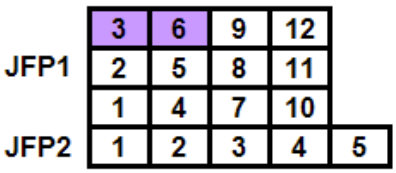


Table B.9: Power Switch/HDD LED/SMBus/Speaker (JFP1)

Pin	Signal	Pin	Signal
1	SPK_P1	2	HDDLED+
3	PWR	4	NC
5	HDDLED-	6	GND
7	SPK_P3	8	SMB_DAT
9	SYS_RST	10	SPK_P4
11	SMB_CLK	12	GND

B.10 USB/LAN ports (LAN1_USB12/LAN2_USB34)

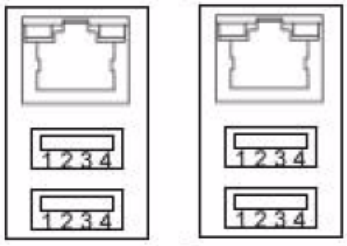
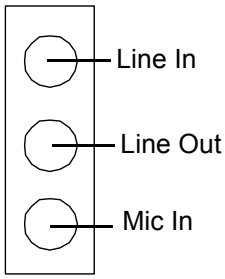


Table B.10: USB Port			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	3	Data0+
2	Data0-	4	GND

Table B.11: Ethernet 10/100 Mbps RJ-45 Port			
Pin	**Signal**	**Pin**	**Signal**
1	XMT+	5	N/C
2	XMT-	6	RCV-
3	RCV+	7	N/C
4	N/C	8	N/C

B.11 Line In, Line Out, Mic In Connector (AUDIO1)



B.12 Serial ATA0/1 (SATA1 ~ 4)

Table B.12: Serial ATA 0/1 (SATA1/SATA2)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	SATA_0TX+
3	SATA_0TX-	4	GND
5	SATA_0RX-	6	SATA_0RX+
7	GND	8	

B.13 AT/ATX Mode (PSON1)

Table B.13: AT/ATX Mode (PSON1)			
Pin	**Signal**	**Pin**	**Signal**
1	#PSON_SIO (to super IO)	2	#PSON (to power supply)
3	GND		

B.14 HD Audio Interface (FPAUD1)

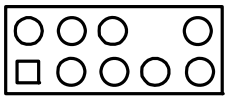


Table B.14: AC-97 Audio Interface (FPAUD1)			
Pin	**Signal**	**Pin**	**Signal**
1	MIC2_L	2	GND
3	MIC2_R	4	FP_AUD_DET
5	LOUT2_R	6	SRTN1
7	LOUT2_DET	8	KEY
9	LOUT2_L	10	SRTN2

B.15 GPIO Pin Header (GPIO1)

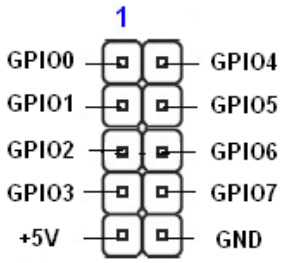


Table B.15: GPIO Pin Header (GPIO1)			
Pin	**Signal**	**Pin**	**Signal**
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+5V	10	GND

B.16 LVDS Connector: LVDS1

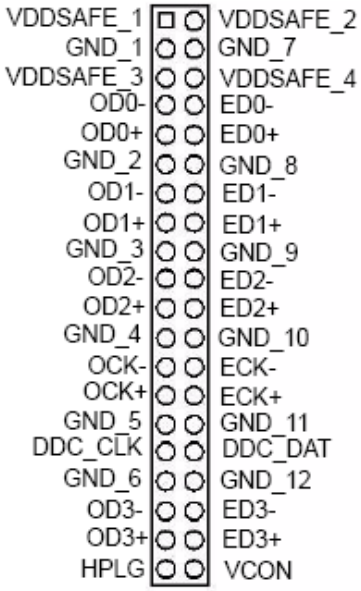
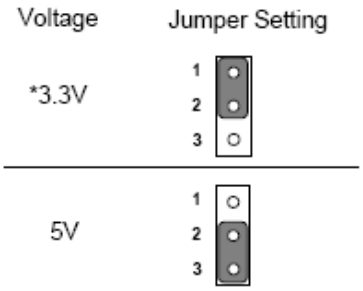


Table B.16: LVDS1 Connector

Pin	Signal	Pin	Signal
1	VDDSAFE_1	2	VDDSAFE_2
3	GND_1	4	GND_7
5	VDDSAFE_3	6	VDDSAFE_4
7	OD0-	8	ED0-
9	OD0+	10	ED0+
11	GND_2	12	GND_8
13	OD1-	14	ED1-
15	OD1+	16	ED1+
17	GND_3	18	GND_9
19	OD2-	20	ED2-
21	OD2+	22	ED2+
23	GND_4	24	GND_10
25	OCK-	26	ECK-
27	OCK+	28	ECK+
29	GND_3	30	GND_11
31	DDC_CLK	32	DDC_DAT
33	GND_6	34	GND_12
35	OD3-	36	ED3-
37	OD3+	38	ED3+
39	HPLG	40	VCON

B.17 LVDS Power Jumper (JLVDS1)



* default setting

Table B.17: LVDS Power Jumper

Pin	Signal
1	VCC3
2	VCC_LCD
3	VCC

B.18 LVDS Inverter (INV1)

Table B.18: LVDS Power Jumper

Pin	Signal
1	+12V
2	GND
3	BL_EN
4	BL_CLT
5	+5V

B.19 ATX Power Connector (EATXPWR1)

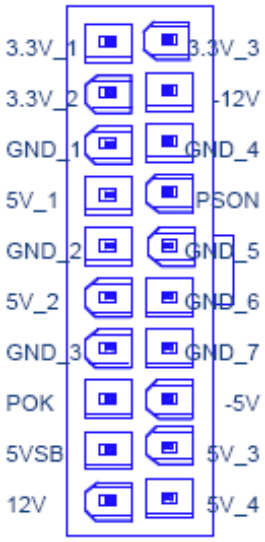


Table B.19: ATX Power Connector (EATXPWR1)

Pin	Signal	Pin	Signal
1	+3.3 V	11	3.3 V
2	+3.3 V	12	-12 V
3	GND	13	GND
4	+5 V	14	PSON
5	GND	15	GND
6	+5 V	16	GND
7	GND	17	GND
8	POK	18	-5 V
9	5 VSB	19	+5 V
10	12 V	20	+5 V

B.20 ATX 12 V connector (EATXPWR2)

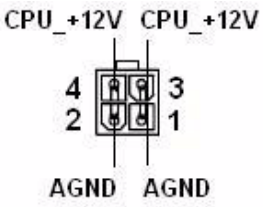


Table B.20: ATX 12 V connector (ATX12V_1)

Pin	Signal	Pin	Signal
1	aGND	2	aGND
3	CPU_+12V	4	CPU_+12V

B.21 DMA Channel Assignments

Table B.21: DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

B.22 Interrupt Assignments

Table B.22: Interrupt Assignments

Priority	Interrupt#	Interrupt source
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Serial communication port 4/6
7	IRQ11	Serial communication port 3/5
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Primary IDE Channel
11	IRQ15	Secondary IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Available
15	IRQ6	Available
16	IRQ7	Parallel port 1 (print port)

B.23 1st MB Memory Map

Table B.23: 1st MB Memory Map

Addr. range (Hex)	Device
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

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